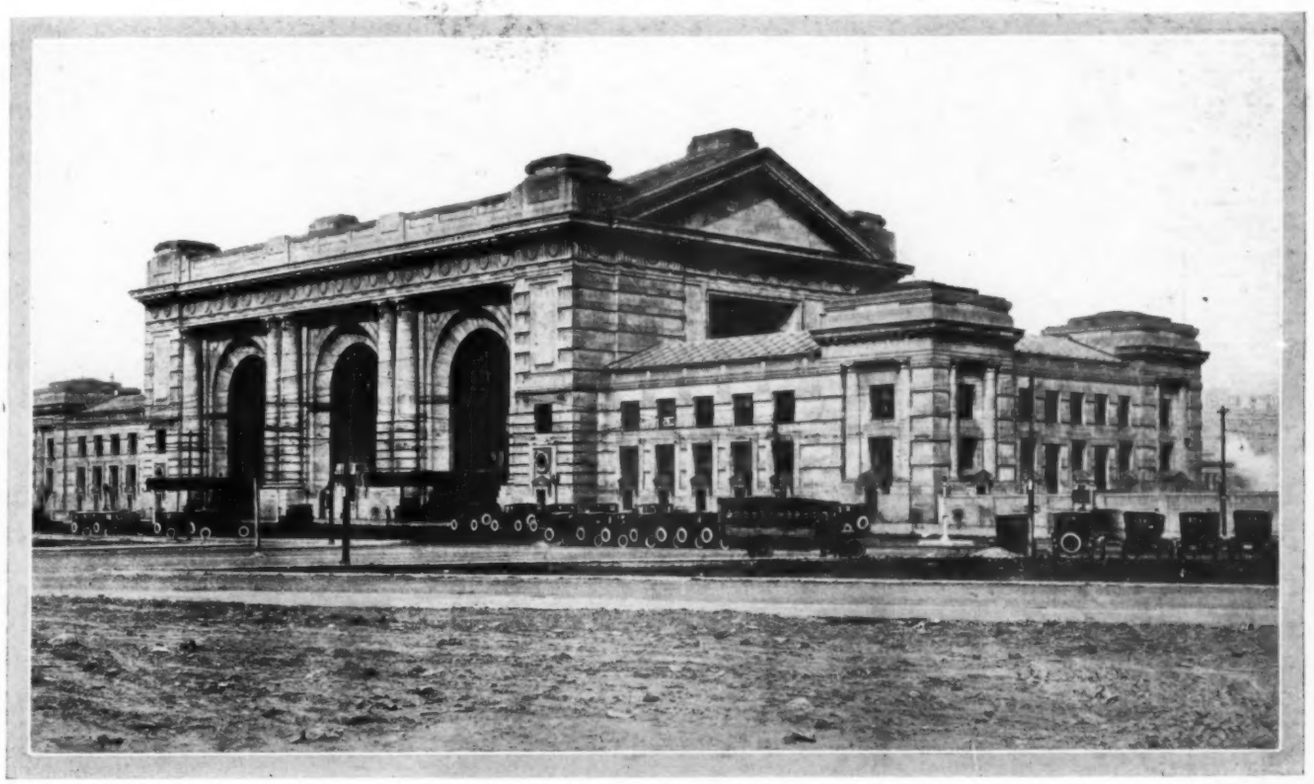
JAN 2 1924

WARM AIR FURNACE SPECIAL

Index of Contents—Page 59.

AMERICAN ARTISAN and Hardware Record

Vol. 86. No. 26. 620 SOUTH MICHIGAN AVENUE, CHICAGO, DECEMBER 29, 1923. $2.00 Per Year.



Union Depot, Kansas City, Missouri, Terminal Railway

After Ten Years' Service—

THE ventilating and heating ducts in the Union Depot, Kansas City Terminal Railway, Kansas City, Mo., are ARMCO-Ingot Iron.

Installed in 1913. In excellent condition in 1923. Ten years of unexcelled service has left no dent in the service life of this Ingot Iron installation.

The American Rolling Mill Co.
Middletown, Ohio

ARMCO Ingot Iron

ARMCO INGOT IRON
TRADE MARK

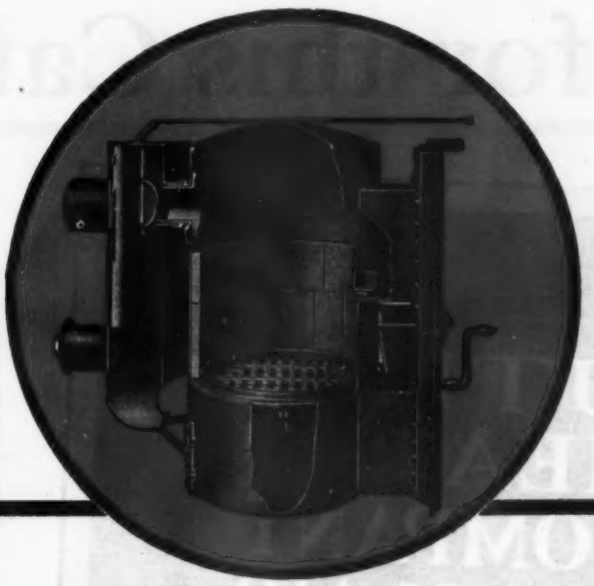
KRUSE

"THE WELDED STEEL FURNACE"

MANUFACTURED BY

KRUSE CO.

INDIANAPOLIS INDIANA



Escape the Rut of Price Competition!

YOU can do it with a Waterbury agency.

Waterbury engineers achieved supremacy by producing a furnace that positively prevents the escape of gas, ash dust or smoke fumes into the furnace casing. They solved the clean heat problem by designing a SEAMLESS body of copper-bearing, rust-resisting steel, welded into one sealed unit.

They further delighted home-owners by cutting their fuel bills—achieved by a straight-side, heavy brick-lined firepot, a large combustion space and long downdraft fire travel.

They built a furnace well adapted to burn natural gas and fuel oil. They put long life into the Waterbury by leaving out cheap materials entirely.

Clean! **THE WATERBURY SEAMLESS FURNACE** *Clean!*

PIPE OR PIPELESS

Waterbury dealers are enthusiastic because in choosing the Waterbury line they lift themselves from the rut of price competition. It is easier to get a fair profit with the Waterbury furnace than with ordinary makes of furnaces. That is the kind of furnace you want to handle — a leader which sells at a profit and builds good will and future business.

Our 1924 Agency Is A Winner!

Learn of our whole-hearted dealer co-operation. Sell the furnace that does something that other furnaces will not do. A card or letter will bring full information.

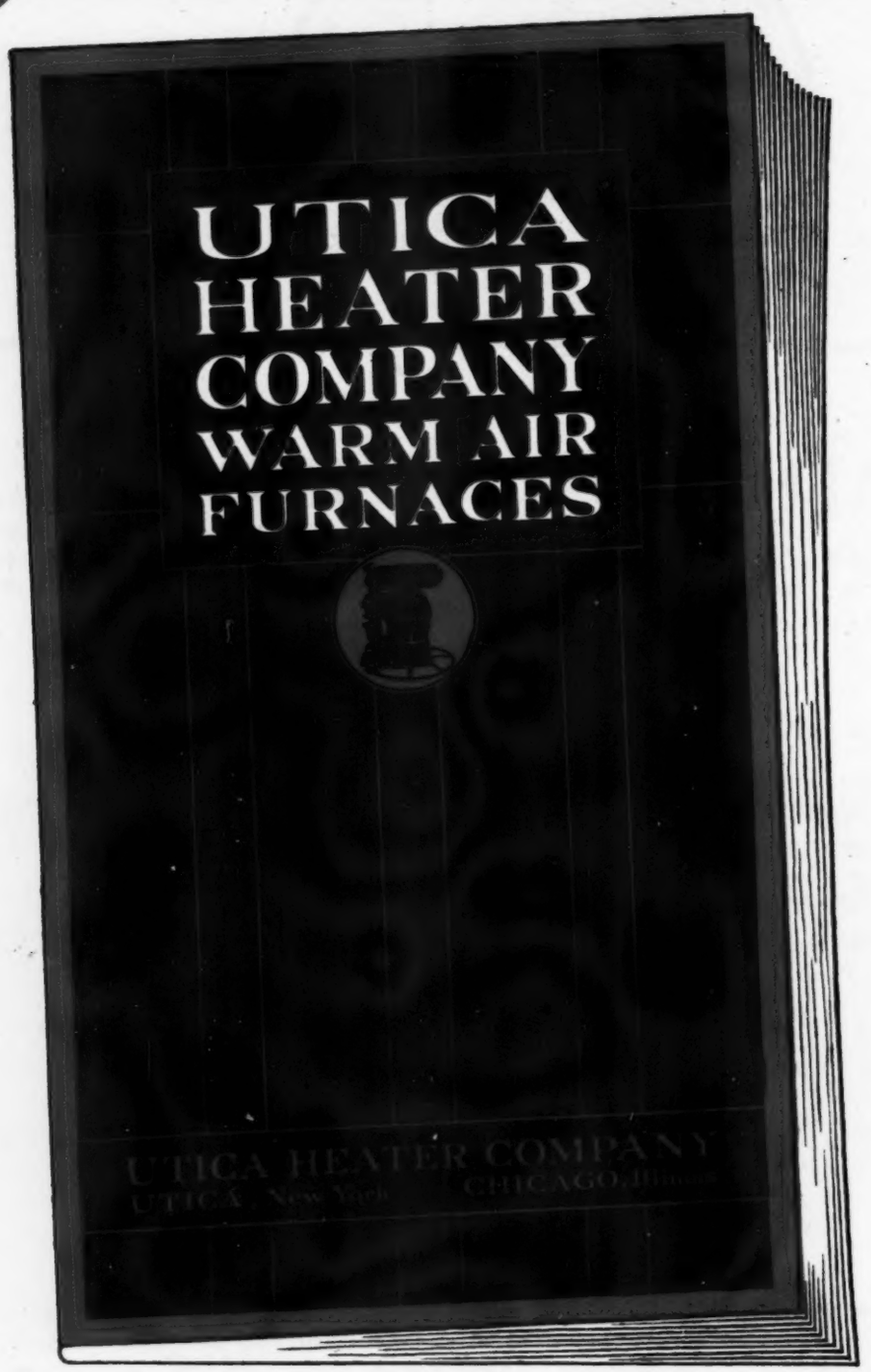
THE WATERMAN-WATERBURY CO.

1121-7 Jackson St., N. E. Minneapolis, Minn.

ALPHABETICAL INDEX AND CLASSIFIED LIST OF ADVERTISERS, Pages 154, 156, 158

Published Weekly. Entered as Second-Class Matter June 25, 1885, at the Post Office at Chicago, Illinois, under act of March 3, 1879.

Send for this Catalog and



Handy Pocket Size

36 Pages of Concise Warm Air Heating Information and Furnace Description

SEND FOR FREE COPY

THIS little book fits your coat pocket and contains the facts you need on every job. It has all the essential tables of sizes of pipes, registers, flues and attachments; standard regulations regarding furnace installations; several systems of determining heater capacities and many other items of every day utility. It is more than a catalog of the Utica Heater Company's line of Furnaces for All Requirements—it is the most useful Handy Data Book published—send for your copy and ask about our Dealer Proposition.

nBook of Valuable Information

IN addition to important information of every day value, this catalog describes the Utica Heater Company TYPE "A" Warm Air Furnaces. These heaters are designed in accordance with special technical research and embody improved features devised by our furnace experts over a long period of time.

This is a worth-while line of furnaces for heating men that believe in a substantial business, selling quality heaters that give continued satisfaction. Write for the catalog and the desirable Utica Heater Company's Dealer Proposition.

SUPERIOR PIPE FURNACES Made for over forty years, they are now mechanically perfected and completely standardized. Accurately fitted and quickly erected. Endorsed by experienced heating men everywhere. A most satisfactory and efficient furnace.

NEW IDEA PIPELESS FURNACES Scientifically proportioned warm and cool air passages. Have triple galvanized casings; improved floor register requires only small opening. Can be installed in a few hours. Many thousands now in successful operation.

SUPER-SMOKELESS FURNACES Burns Soft Coal Smokelessly. A remarkably successful heater now in use in all soft coal sections. Thoroughly durable and practical. An exclusive and profitable proposition for the progressive heating man.

SUPERIOR Pipe Furnace NEW IDEA Pipeless Furnace SUPER-SMOKELESS Furnace

UTICA HEATER COMPANY, UTICA, N.Y.

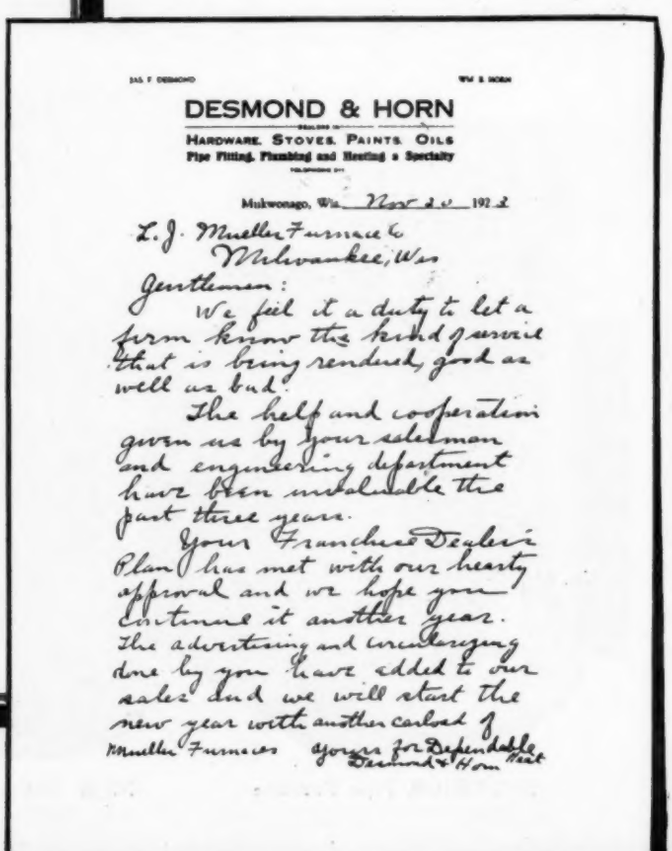
218-220 WEST KINZIE ST. CHICAGO, ILL.

MUELLER

Assure a *Permanent,*

TWO things are absolutely essential to your prosperity as a retailer of furnaces—the first is more important than the last, for even big profits from a season's sales of an ordinary furnace are small comfort when complaints pour in and the prospects for next season are dark. Permanence is the big thing! Build for it with Mueller Furnaces. They've been here for 67 years, and they'll be here when you pass the business on to the next generation. They're the

Mueller Convector (the Heating System without Pipes) with oversize register.



DESMOND & HORN

HARDWARE. STOVES. PAINTS. OILS
Pipe Fitting, Plumbing and Heating a Specialty

Mukwonago, Wis. Nov 2 v 192 3

L. J. Mueller Furnace Co
Milwaukee, Wis

Gentlemen:

We feel it a duty to let a firm know the kind of service that is being rendered, good as well as bad.

The help and cooperation given us by your salesman and engineering department have been invaluable the past three years.

Your Franchised Dealer's Plan has met with our hearty approval and we hope you continue it another year. The advertising and circularizing done by you have added to our sales and we will start the new year with another carload of Mueller Furnaces yours for Dependable Heat

Desmond & Horn

dependable heat

L. J. MUELLER FURNACE CO., 193 Reed St., Milwaukee, Wis.

FURNACES

Profitable Business

finest furnaces you can ever install—they bring praise and more sales after they're in, instead of complaints. And we help you sell them by giving you live, result-getting advertising service, sales promotion help of all kinds, a sound easy payment plan, and skilled Engineering Service for every Mueller installation you sell.

The best time in the world to put your business on a permanent, profitable basis is *right now!* Write or wire for our proposition.

H. M. MAGINOT SALES CO.,
WARM AIR, HOT WATER AND STEAM
HEATING SYSTEMS.
BUILDING EQUIPMENT.
179 FAYETTE STREET.
HAMMOND, IND.

November 7th, 1923.

L.J. Mueller Furnace Co.,
Milwaukee, Wis.

Gentlemen:-

My dealings with your Company have been and are very satisfactory.

Before taking on your line I personally visited many furnace factories, investigated their service and methods of doing business, but in the end I was satisfied that you have the goods.

Other manufacturers give service, but I have yet to find one to equal the Mueller engineering, Consumer circularizing, Newspaper advertising and shipping service. But even should I forget the service, its the article that counts. Many dealers ask me why I handle the Mueller line as it is too high priced a line to sell, but if we compare prices Mueller aint so far above the rest. And when I put in a Mueller, especially the double radiator job, I get the satisfaction of giving the customer a real "Honest to God" heating system and besides I get a better margin on it than the other fellows as I find I am in a class all by myself with the double radiator, and besides I got the return flue type to fall back on when it comes to a price job.

So after all is said and done I feel that the L. J. Mueller Furnace Co. is more than a Furnace & Boiler factory, and one thing I am sure of is that they are Manufacturers of "DEPENDABLE HEAT" heating systems.

Sincerely yours,

H.M. MAGINOT SALES CO.

Henry M Maginot

Mueller Double Radiator Furnace; Two radiators, twenty pipes give greatest heating surface.

easier to sell than to sell against

Makers of Warm Air, Steam, Vapor and Hot Water Heating Systems, Garage Heaters, Etc.

be sure you have the right furnace

THE dealer who goes on year after year—even if for only two or three years—selling a furnace that doesn't do his good installation work full justice, is not only standing still but he is losing business and much money.

You should be *sure* that the furnace you are using to sell your customers warm air heating is the *right* furnace. It is easy for you to do that—simply study the field.

The Weir Steel Furnace has some exclusive features that will interest you and your customers

AMONG these features and the one of greatest importance is the Weir Gas and Soot Consuming Fire Pot.

Notice from the illustration at the left in the right hand corner the opening "Gas Draft"—the air is drawn in thru this opening and passes three times around the fire pot (see illustration on opposite page) there becoming thoroughly heated; it then enters the fire pot thru the openings at the top, actually burning the gases as shown here, and creating an intensely hot fire.

This is a Weir Patented feature—it is not merely a "device" or after thought, but a big main part of the furnace itself.

No other furnace has anything like it and to prove that this Weir feature is a fact we put a window in the feed door so you can see how this feature actually burns the gas and soot.

MOIST warm air is assured with the Weir—notice the large, correctly placed water pan. Large feed and ashpit doors, improved shaker arrangement and double casing rings at each casing joint. These and other "little things" are made truly important on the Weir.

We have several booklets that go into all the details of this heavy steel welded seam constructed furnace. Write for them today. Study the entire field of furnaces, study the Weir, and then be sure to have the right furnace for your 1924 business.

THE Weir can be your means of hitting a real business getting stride. Its backing is in keeping with its high quality—every Weir agency benefits by a strong, extensive and practical dealer help campaign. Our engineering department has experts always at your disposal.

Write today and have us tell you how we follow up your prospects and help you close deals.

The Weir agency plans and prices for 1924 are ready—shall we mail them or have a Weir representative call on you?

The MEYER FURNACE Co.

Peoria-Illinois

CONSUMING

FURNACE

The New and Even Better

GILTEDGE
FURNACE

THE furnace whose advantages in Heating, Efficiency, Economy, Convenience and Durability will appeal powerfully to the people of your community.

Dealers who handled it during the past season found it a ready seller on self-evident merit, in the face of all competition.

Householders whose homes it heated last winter, are so solidly sold on it that they are advising their friends to install the New and Even Better Gilt Edge Furnace.

As a matter of being thoroughly posted on the latest developments in warm air construction and operation, if for no other reason, you should know more about the New and Even Better Gilt Edge.

Write us to send you the complete story,
written by a furnace man for furnace men

R. J. SCHWAB & SONS COMPANY

279 Clinton Street **Milwaukee, Wis.**

The New and Even Better

GILTEDGE

AGENCY

A BUSINESS proposition that gives you a flying get-away in both sales and profits.

A most liberal contract based on a new scale of prices with provisions for exclusive representation where the heating contractor can meet certain very reasonable requirements.

Whole-hearted co-operation in locating opportunities for furnace installations, cultivating prospects and consummating the sales.

This co-operation does not consist of the mere general publicity of national advertising, or of dishing out dealer helps from a general stock-room. Plans and publicity are worked out *with you*, expressly for *your business*.

"Sounds interesting," you say. We'll prove that it is—decidedly—when we get your request for fuller details

R. J. SCHWAB & SONS COMPANY

279 Clinton Street **Milwaukee, Wis.**

EVERY year the Wise owl trade mark is seen in more homes, every year sees new Wise dealers and the old ones selling more Wise Furnaces.

This is fact and not fancy — nearly twenty years of successful business and a clientele growing bigger every year means something to Wise dealers.

Wise furnaces are good furnaces and their design and quality have more than kept pace with the best that science of warm air heating has to offer.

Wise furnaces are neither "tricks" or "hurry-up" castings. We make them sound, durable and of the best grade iron obtainable.

HAVE us send you the Wise catalogs *now*. Examine Wise construction and all its features and you will realize that Wise quality and workmanship is something to bank on. We call your particular attention to the great durability of the Wise Furnace and its numerous superior heating and convenience features.

The Wise guarantee—Highest Quality, Best Workmanship and Absolute Satisfaction to Our Customers.

This means just what it says and you'll find this superior quality in every Wise furnace you handle.

Ask for catalog showing Wise Furnaces and you'll soon be selling a furnace that gives you good profits and your customers the highest furnace value obtainable.

The **WISE**
AKRON

W I

WISE furnaces are clean cut with smooth, perfect castings.

Their many practical features make them producers of abundant moist warm air with a considerable saving in fuel, labor and operating expense.

You want to sell a furnace like the Wise—a furnace that is of dependable quality, a furnace that is up-to-date and in demand. Wise guarantees its furnaces and cooperates with its dealers in a manner they like.

If your territory is open we want to talk business with you and we have an agency proposition that makes furnace business for you satisfactory, easy and profitable.

Write for Wise Agency particulars today.

THE Wise Pipeless illustrated is a true Wise quality furnace in a pipeless casing. Its great popularity is due to this quality in castings fitted in a properly designed pipeless arrangement.

Our special Pipeless catalog gives complete details on the gas and smoke consuming firepot and patented radiator and feed section which eliminates the objectional clean-out and allows easy access for cleaning through upper feed door. These two features alone make it a quality selling furnace. Go over the Wise Pipeless in detail now and see why we can guarantee its value as we do the Wise Pipe Furnace.

FURNACE Co.
OHIO

S E

Direct Draft Damper Rod

One Piece Cast Dome

This Special Radiator provides 100 to 300 Per Cent More direct radiating surface

AN exclusive feature and one that makes the New Floral City Furnace a world beater for sales.

Let us show you in detail just what this efficient construction means to your customers.

Tell us to send you complete description of this Special Radiator.

The New Floral City Furnace

10 IMPORTANT FEATURES

1. One hundred to three hundred per cent more direct heating surface.
2. More rapid circulation of air.
3. Better combustion of smoke and gases.
4. Large double feed door.
5. Greatly increased durability.
6. Triple flued down draft radiator.
7. Convenient and efficient air moistener.
8. Smoke pipe can be taken off at any angle.
9. Flat or triangular grates, interchangeable.
10. Perfectly suited for burning any fuel.

Our Sales Plan is Different—

AND not just different but better. Its co-operation features and money-making factors will surely interest you.

We want you as a live dealer to study over the complete Floral City line of quality heaters and our agency plan for 1924.

Our catalogs and new special circulars describe and illustrate The New Floral City, The Floral City Queen and our other furnaces completely.

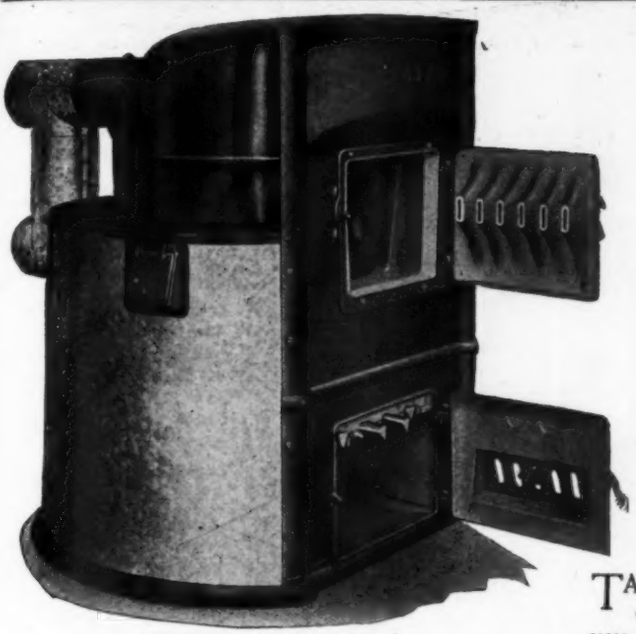
Drop us a post card and read them over —you'll find some new worth while furnace heating ideas in them too.

The Monroe Foundry & Furnace Co.

MONROE, MICHIGAN

High Grade Furnaces for over 40 Years. DETROIT BRANCH: 458 Penobscot Bldg.

THATCHER *Furnaces*



THATCHER SMOKELESS

THATCHER NEW PACIFIC

Over 72 years of Leadership in the Warm Air Heating Industry

—and what it means to you

TAKE your own business for instance—when you first started you couldn't give your customers the service or the quality of goods that you gave buyers after being established about five years. It took perhaps even more time for you to thoroughly organize your business—it took time to find out what was best.

That's what Thatcher's 72 years of Leadership means. It means we have always progressed—yet conservatively. We have more than kept step with the best practical ideas in furnace construction by being able to work and plan ahead, sticking everlastingly to a high quality basis.

It is hard to get the THATCHER Agency because it is held on to so long.

OUR books show names of men who have been holding the Thatcher Agency continuously for ten, twenty and up to thirty years.

That's because they are live dealers and because they have become permanent and profit making business partners getting and using the incomparable and complete Thatcher furnace service.

This is the THATCHER GUARANTEE

Every Thatcher furnace is strictly high grade and exactly as represented—always. A complete line—a complete service in all our dealings with our agency holders. A line you can stick to—a permanent, sound business connection. Conservative prices at all times, to enable our agencies to make good profits.

SUCH things as Free installation plan service, sales co-operation, dealer helps, etc., are not so-called features of the Thatcher Agency—they are each as much a part of the Thatcher Agency as Thatcher Furnaces themselves.

All Thatcher Furnaces are guaranteed to be first quality because we couldn't afford to sell them if they were not as represented.

Thatcher agency details for 1924 and our catalog and circulars describing the Thatcher Smokeless, Thatcher New Pacific and the complete Thatcher line sent on request—or we will have a representative call if you wish.

THATCHER FURNACE CO., 341 N. Clark Street, CHICAGO, ILL.
133-135 W. 35th St., NEW YORK, N. Y.
39-41 St. Francis Street, NEWARK, N. J.

SIMMPLEX

Full front. Attractive design—Column style.

Cleanout on front. Collar extends clear through front section.

Double feed door equipped with gas tight flanges.

Extra large water pan on front of furnace.

Lever type shaking device. Shakes or turns all four bars — Is permanently connected.

Openings in ashpit door unnecessary with our type of shaker.

One piece cast iron radiator made by the Simms moulding method which insures even thickness of metal.

Extra height in combustion chamber, efficient for all kinds of fuel. Gives great amount of heating surface.

Large bell cup joints giving ample space for expansion.

Extra heavy straight fire pots giving more grate area.

One piece extra large ashpit straight sides.

One piece solid cast iron base bottom.

Would you like to double your Furnace business like others have done with the "SIMMPLEX" line?

The "SIMMPLEX" Furnace is conceded by all who have seen it to be the most remarkable standard type Furnace on the market.

SIMMS FOUNDRY CORPORATION

MANUFACTURERS OF

PIPE AND PIPELESS WARM AIR FURNACES

RACINE, WISCONSIN

STEEL

PIPE **PIPELESS**

THE health and growth of your furnace business are dependent—on your selling efforts—on the furnace you sell—and—on the kind of cooperation you get from the manufacturer.

Lennox judges the health and growth of its own business with these facts in mind.

Lennox secures men like you as its dealer associates. Conservative yet progressive men who make a good business of selling a good furnace correctly installed.

The Lennox Torrid Zone Steel Furnace is a good furnace—it has proven itself good to dealers and users for over twenty-seven years.

Its steel, gas-tight construction assures the user of the most sought for quality in any form of heating—clean heat. Its large area of radiating surface provides an abundance of this clean, fresh, moist, warm air. It is economical, long-lived, easy to operate and it can't crack or burn out.

We cooperate with you in a practical manner—there is a Lennox Heating Engineer in your district—available to assist you in your installation problems.

Lennox furnishes interesting, result getting dealer helps of various kinds from folders and signs to made-up ads and picture slides, backing up this work of yours with an interesting, complete follow up on prospects direct from this office.

We want to go over every detail of Lennox Torrid Zone Furnace construction and its sales possibilities with you—write for the Lennox Torrid Zone Manual of Warm Air Heating NOW.

LENNOX TORRID ZONE FURNACES

THE LENNOX FURNACE CO.
200 Lincoln Highway, Marshalltown, Ia.

APPROVED BY
NATIONAL WARM AIR HEATING & VENTILATING ASSOCIATION
FRESH AIR HEAT MEANS HEALTH

We bring the buyers to your door

Our idea is to work with and for our dealers every minute—never stop in our efforts to bring more trade to your door.

THE RED CROSS LINE

is backed by an original and effective selling plan prepared by experts with years of knowledge in the furnace line.

Means more business and greater profits.

Get Full Particulars covering the agency in your city

It will be worth your while to investigate this dealers' plan—one that will help in the making of furnace sales.

Send for it; learn why the Red Cross AJAX and EMPIRE furnaces have so many friends among the trade.

Get full particulars now and prepare for big business in

1924

CO-OPERATIVE FOUNDRY COMPANY

ROCHESTER, N. Y. **CHICAGO, ILL.**

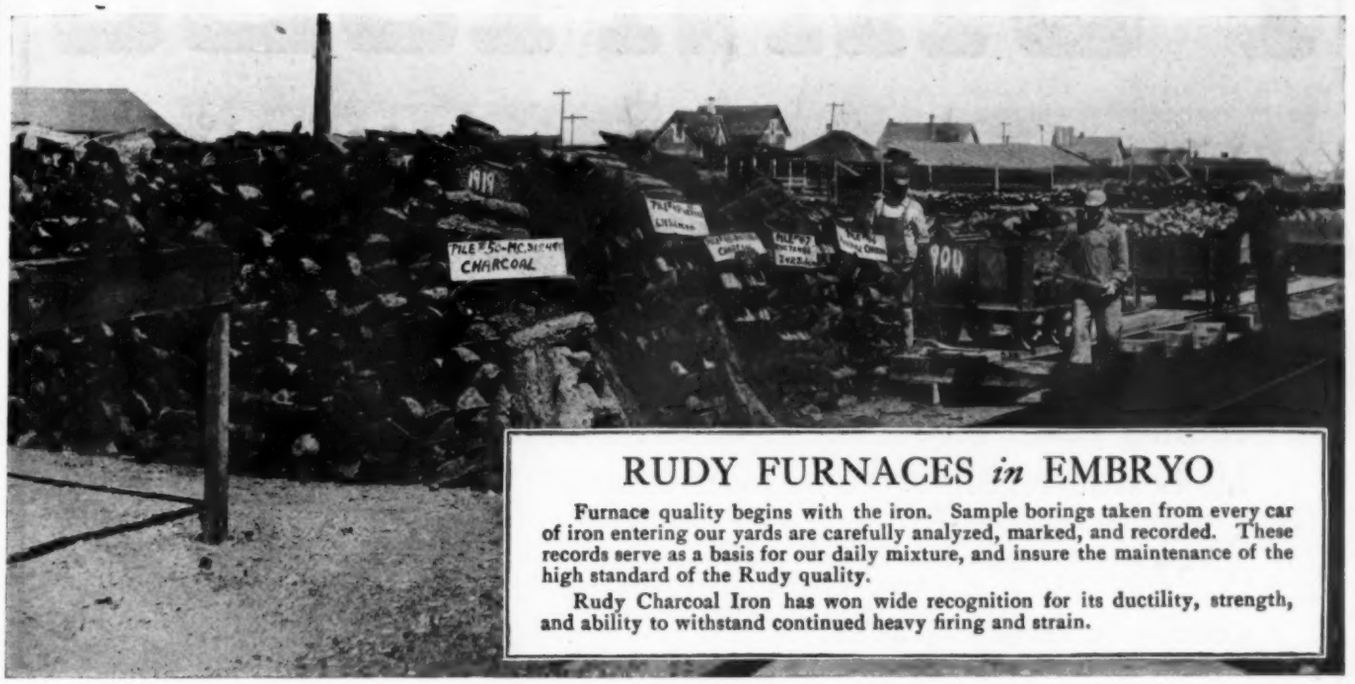
RED CROSS

THE PRESTIGE OF QUALITY

From Pig Iron To Finished Product

RUDY FURNACES

ARE excelled by none in smoothness of casting, exactness of fit, correctness of design or efficiency in operation.



RUDY FURNACES *in* EMBRYO

Furnace quality begins with the iron. Sample borings taken from every car of iron entering our yards are carefully analyzed, marked, and recorded. These records serve as a basis for our daily mixture, and insure the maintenance of the high standard of the Rudy quality.

Rudy Charcoal Iron has won wide recognition for its ductility, strength, and ability to withstand continued heavy firing and strain.

That Accounts For Rudy Popularity

THE RUDY "HY-POWER"

A RUDY AGENCY is a real asset to the furnace installer. Send for our beautiful new catalog and ask about the Rudy Agency proposition under the Rudy Profit Sharing Schedule (copyrighted). Get a furnace with which you can build future business.

MADE IN DOWAGIAC
RUDY
FURNACES
BY THOSE WHO KNOW HOW

RUDY TOP RADIATOR

THE RUDY FURNACE COMPANY, DOWAGIAC, MICHIGAN

MONCRIEF FURNACES

EACH year we have endeavored to improve in the manufacture and in service to dealers on Moncrief Furnaces, pipe, fittings and other accessories. In 1923 the Service rendered our dealers was far better than ever before and yet the total volume far exceeded the previous year. During the coming year every member of our organization will put forth his best efforts to serve our customers.

Moncrief Furnaces are made in various series and in a complete range of sizes.

Moncrief Pipe and Fittings are well constructed and deserve your consideration.

We solicit your inquiries. Let us send you our catalogs.

THE HENRY FURNACE & FOUNDRY CO

Cleveland, Ohio

If it's used on a warm air heating job—
We've got it.

EASTERN SALES OFFICES:

E. L. Garner,
177 23rd Street,
Jackson Heights, L. I., N. Y.

F. H. Hanlon,
Batavia, N. Y.

W. S. McCrea,
105 Federal St., N. S.
Pittsburgh, Pa.

WESTERN DISTRIBUTOR:
Johnson Furnace Co.,
Kansas City, Missouri

SOUTHERN DISTRIBUTORS:
Moncrief Furnace Company,
Atlanta, Ga.

PIPE **MASTER** PIPELESS

Reg. U. S. Patent Office

Warm Air Furnaces

MASTER FURNACES will help increase your profit account. They will help build up your good will and reputation as a heating man in your community. Furnace men looked upon as heating authorities recommend and push the sale of Master Furnaces with confidence.

RADIATOR is exceptionally large. Has more radiation surface than any other radiator of its type. Joint is made permanently tight by the use of heavy bolts placed at close intervals. Radiator will swing to place smoke collar in any position.

COMBUSTION DOME built extra heavy to withstand the constant strain of flames striking against it. The opening at the top is large enough to admit the passing of the burning gases into the radiator and yet not so large as to allow the gases to rush out unconsumed. A pocket is cast into the side of feed section so that the water coil when installed will not interfere with firing.

TWO-PIECE FIRE POT allows for expansion and contraction. Made extra heavy and corrugated to give increased radiation surface. The cup joints are deep and are permanently sealed with asbestos cement when erected.

LARGE ROOMY ASH PIT. Joints are deep and fit tight. Heavy triangular grate bars—can be removed in one minute. No grate rings, cotter pins or bolts to burn out.

FULL CAST FRONT. All castings fit perfectly. Weights throughout are properly distributed.

FIRE DOOR made extra large to permit firing large chunks of coal or wood.

WATER PAN is of ample capacity so placed that the water evaporates rapidly. This produces a balmy warm air conducive to health and comfort. Handy to fill.

ASH-PIT door is well fitted and full width of ash-pit for convenience in removing ashes.

DRAFT DOOR is large and adjusted by a convenient regulator plate placed in one of the rooms above.

MASTER FURNACES ARE SIMPLE IN DESIGN AND STURDY IN CONSTRUCTION

Durability is maintained throughout. We guarantee a perfect fit. The especially designed notch arrangement in the grooves of the ash pit and fire pot joints insures correct alignment of front and base ring when putting on casings.

Master prices are right. You can sell the general contractor or the home owner and feel assured that the Master Furnace will give satisfaction under the most trying conditions.

DO NOT WAIT—WRITE TODAY FOR CATALOG AND NET PRICES

MOUNT VERNON FURNACE & MFG. CO.

MT. VERNON, ILL.

"If others won't---a Schill will"

Something distinctly better is what you want—here it is—

The COZY FURNACE

THIS Schill Cozy will make a hit with you and your customers. It has the desired quality and features without extravagance. Notice the height and width of the full cast front—and a casing four inches larger than found on other furnaces of the same size.

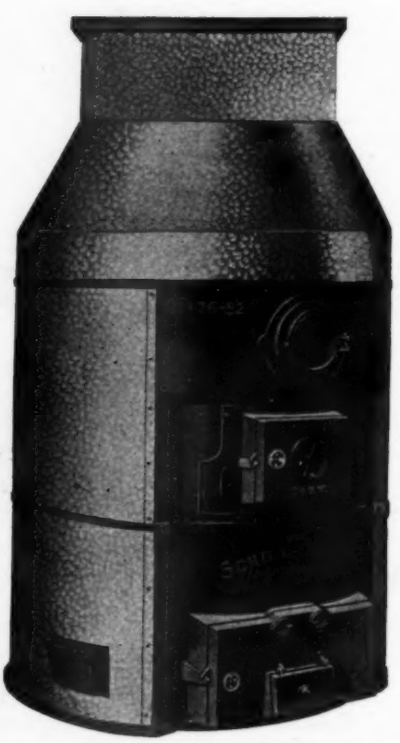
The Ash Pit is cast in one piece, the Fire Pot has extra deep cup joints. The radiator is two piece construction with smoke and clean out collars extending through the casing—large neck and extra large wall surface giving greatly added radiating surface.

This Schill will build business and make more profits for you.

Where a Pipeless can be used install the— COZY Pipeless Furnace

THE Cozy Pipeless Furnace has the same construction and quality castings as the Cozy Pipe Furnace. The same features of better heating and convenience prevail—the only difference is the Pipeless arrangement. This Cozy Pipeless is a big seller and because of its superior quality is the last word in economical heating.

Write today for our catalogs, circulars and booklets on Warm Air Heating and the Schill line of quality heaters—they will interest you.



SCHILL'S GUARANTEE AND SERVICE

When you become a Schill dealer you become affiliated with a company of long and successful experience—over thirty years making Warm Air Furnaces. We guarantee every Schill Furnace and our Engineering Department therefore gives you complete careful advice and prepares plans to assist you in making perfect installations.

You sell Schill Furnaces on a "make good or money back guarantee." Let us show you now how we give this service and practical selling helps and make every Schill agency a money maker.

Write today for 1924 agency details.

The SCHILL BROTHERS COMPANY
CRESTLINE, OHIO

From the Dealer's Point of View

You want first heaters that will last

Premiers stand up because they are correctly designed and made with an overmargin of safety.

You want simplified installation

The Premier Radiator may be turned to any desired angle without additional Cleanout Doors and Frames. Water coil openings at both sides of the Feed Door and a Patented Casing Ring Expansion Lock further facilitate installation.

All Cast Construction

You want selling helps

The Premier Merchandising Service sold every other furnace for our Dealers during 1923. There is no cost to you for this service, neither does it take any extra time on your part.

You Need a Simplified Plan for Partial Payments

We have it. The usual red tape is eliminated. The plan operates on a basis that actually pays you an extra profit. You deal with us, not with an outside financing corporation.

You should have exclusive territory

Every Premier Dealer has exclusive territory. New territories are now available. Now is the time to take the matter up with us.

PREMIER WARM AIR HEATER CO.
DOWAGIAC, MICH.

HERO up-to-date FURNACES

Warm Air Heating is always advancing and the Hero Policy is to keep up with every improvement

THE Hero line of better furnaces (pipe and pipeless) and the Hero liberal profit agency proposition are making furnace men real heating contractors.

Our installation and advertising cooperation are unusual business building assets—Write and have us tell you all about it.

THE NEW HERO AIR-JET FURNACE

A new Hero furnace with a new Hero Patented combination feature. Notice the Air-Blast that Superheats the air, simply and effectively burning the smoke and gases.

Sturdily built throughout, one-piece dome and numerous other features. A fuel saver—a money maker. Have us tell you about it in detail.

THE HERO-TITAN SUPERHEATER

Install a Titan and you'll know its great durability and super heating qualities will make it a most satisfactory heating investment for your customers. Notice the extra deep, fully capped joints, the massive thickness of the castings and the up-to-date design. It sells and gives you good profits.

THE HERO AIR-WASHER HEATING SYSTEMS

Hero Air-Washer Furnaces provide quality heating plants that not only supply adequate and properly moistened warm air but air that is purified before it is sent to the rooms.

Hero Air-Washer Furnaces are like all Hero Furnaces, quality built, also possessing all other modern features of construction

Write today for the Hero agency details and complete catalogs and special circulars.

HERO
FURNACE COMPANY
Sycamore, Illinois

"ZERO KING"

At prices that boost sales!

The weight
is properly proportioned

CONSTRUCTION IS THE BEST AND EXTREMELY SIMPLE

EASILY MOUNTED

"ZERO KING" FURNACES
are made in SEVEN SIZES

FOUR different series in Pipe Furnaces
FIVE different series in Pipeless Furnaces

Our prices on these high quality furnaces will interest you—
Write today

OAKLAND FOUNDRY CO., Inc.
BELLEVILLE, ILL.

1924 PRICES NOW READY ON THE

FAMOUS

Speaks for itself—Write us for literature and prices.

THE EXCELSIOR STEEL FURNACE COMPANY

118 So. Clinton Street **Chicago, Illinois**

BOOMER

THE unusual design of the radiator chamber gives added radiating surface and allows full heating value for all fuel burned.

NOTICE the extra wide radiating wings on the fire pot—these wings increase its radiating surface about two-thirds over the ordinary fire pot.

Boomer Warm Air Furnaces have been sales boosters and profit makers for hundreds of dealers for over forty years—

THEY sell all the time because they represent good heating plant investments for everyone at all times. They are built extra heavy of the best quality cast iron and are in fact the most successful and economical burners of soft coal, coke, wood or natural gas because their unusually efficient design gives them greatly increased radiating surface.

Ally yourself with Boomer Warm Air Heaters. The Boomer agency is more desirable now than ever before. Our ever increasing co-operation with our dealers is helping them get extra sales and we can do the same for you.

Send us your name and let us tell you about the Boomer Agency for 1924. We will gladly give you complete details and our new prices—write TODAY.

THE HESS-SNYDER COMPANY

MASSILLON, OHIO

Be an American dealer!

"First—I became an American, then I became an American dealer"

ONE of our good friends wrote us this line in a recent letter in which he told us why he was selling more American Furnaces this year than last.

He is making money selling the

AMERICAN
BOILER PLATE
Warm Air Furnace

"My customers see that the American Furnace is something different and when I point out its riveted and caulked steel construction they see at once why it is bound to be strong, durable and leak proof."

He went further and told us he advertised more this year and used our dealer helps.

He wound up by saying "The American Furnace has so many good points to talk about and they are so convincing that I now find it easier to sell than a cheaper furnace made of cast iron and I am making more money."

You can become an American dealer—you can build your business, make bigger profits and get our real selling cooperation.

Let us tell you all about American Furnace construction. Write for our catalog today.

AMERICAN FURNACE CO.
2719 to 2731 Morgan Street
ST. LOUIS, MO.

THERMO
CAST-IRON FURNACE

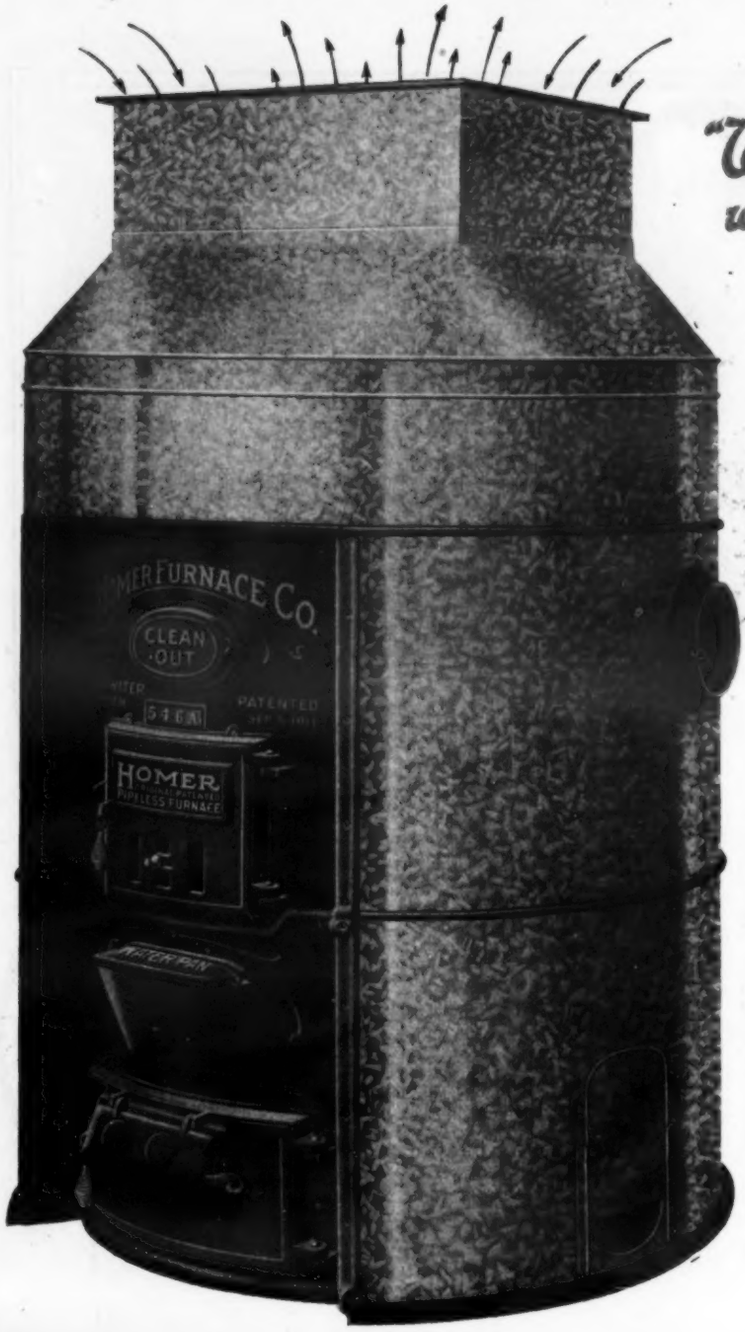
is a good money maker because we make it better and sell it at a price that enables you to meet competition. It has some real construction features that will appeal to your customers. Write today for particulars on the Thermo and our complete line.

THE AMERICAN AGENCY

will enable you to go after and get business next year.

Just send us a note and we'll talk it over with you.

If you sell furnaces you can sell the American and make better profits.



"What's home without a Homer"

"You'll never know until you've joined the Homer Family—

The Largest on Earth

And TO THEM

We express our appreciation for their support during 1923 which,

By the way, Boys,

Has Been the Largest Production Year in our History."

If you are not already a member of the Homer Family—

We extend to you a very cordial invitation to join.

Because

"There's Harmony in Homer Heated Homes"

HOMER FURNACE CO.

COLDWATER, MICH., U. S. A.

2000 Series "Quick Heater" Furnaces

Furnace Men Found It So—

—their letters state that they could depend upon our promptness in shipping—that this resulted in better jobs, more satisfied customers, better profits;
—that they will use more "Quick Heaters" and more "Quick Service" this year!

—it is gratifying to us to have this confidence of the trade. This splendid, prompt service was accomplished regardless of difficulties brought about by a general scarcity of merchandise.

The "QUICK HEATER" Line

—You too can depend upon the "Quick Heater" and its attending line of Hart & Cooley Registers, Lamneck Pipe and Fittings, and our full line of furnace accessories.

Your orders will be promptly shipped from a greater warehouse, and a greater stock than we have ever carried before. The goods are here, in our Des Moines Warehouse, ready for you.

The "Quick Heater" exceeded our greatest hopes in its 1923 business. Dealers were pleased with it; their customers like it. Many of our dealers have profited by our rebate plan on furnaces.

Note the dependability of the "Quick Heater" line; the lines of merchandise we sell are universally known as leaders of their classes. **Remember—we can ship your orders promptly.**

Distributors of
Lamneck
Simplified
Furnace Fittinsg
—for all territory west of the Mississippi River. Full stock carried in our Des Moines warehouse for prompt shipment.

Distributors of
Hart & Cooley
Registers
—with the patented pinched up fret-work giving greater air capacity, strength and durability. Full stocks carried at Des Moines.

Full line of Furnace Accessories carried at all times.

New catalogue ready January 1. See it, by all means, before you place any specifications for 1924. Get our Prices!

Quick Furnace & Supply Company

Second and Court **DES MOINES, IOWA**

YOU can't get good business in 1924 unless you sell furnaces possessing out-of-the ordinary good quality at prices that will appeal.

WIECHERT
BELLEVILLE ILLINOIS.

Furnaces

are
High Quality Products at Quantity Prices

OUR large production enables us to keep the quality up and the price down.

We want you to study the construction and quality of Wiechert Furnaces—we want you to see the high quality of the grey iron we use to make these castings—we want to show you why Wiechert Furnaces are in demand.

Wiechert Furnaces are correctly designed warm air heating apparatus and their sturdiness, weight and fit are the utmost regardless of price.

Sell these better furnaces with better profit to you

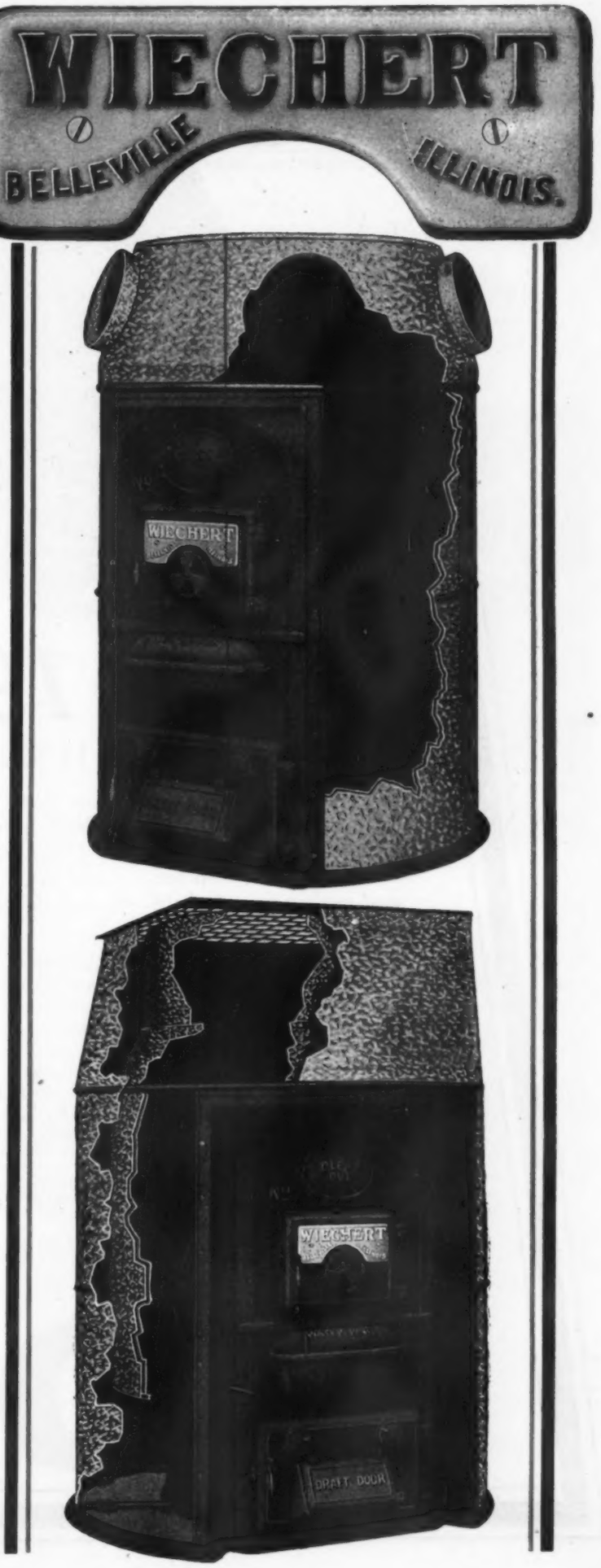
You want to sell good quality furnaces, yet you want to make good profits. Wiechert production prices mean Wiechert agency profits.

Write now and have us send you full information on the Wiechert Agency for your territory.

Our catalog describes and illustrates our line in detail—write for a copy today.

CHICAGO DISTRIBUTOR:
Red Front Furnace & Supply Company
149 W. Austin Ave. - - - Chicago, Ill.

St. Clair Foundry Corporation
Belleville - Illinois



For 1924

GLOBE FURNACES

The GLOBE Dealer possesses that priceless *something* called *CONFIDENCE*. *CONFIDENCE* in his line—in the institution building furnaces for him and *CONFIDENCE* in his ability to look his customer in the eye and say: *"Jim, I'm giving you the most modern furnace built—by far the biggest value I know of—and the price is absolutely right."*

When you go over the GLOBE inch by inch—examine its finish, its fuel and labor saving equipment—and then consider the cost to you—*You* will then see for yourself just *how* the GLOBE Dealer does it. *Ready Sales—Prestige—Profit.* A request from you will bring our complete co-operative and exclusive agency plan, catalog and prices.

Pipe - - Pipeless - - Three Pipe System

Built in Five Sizes

GLOBE DISTRIBUTORS For their respective territories.
Other territories open for jobbing condections.

TOWNLEY METAL & HARDWARE CO.
Kansas City, Mo.

PAXTON AND GALLAGHER CO.
Omaha, Nebr.

HARPER & McINTIRE CO.
Ottumwa, Iowa

HARPER & McINTIRE CO.
Cedar Rapids, Iowa

MORLEY-MURPHY HDW. CO.
Green Bay, Wis.

MORLEY-MURPHY HDW. CO.
Minneapolis, Minn.

The GLOBE STOVE & RANGE CO.,

Department F KOKOMO, INDIANA *Department F*

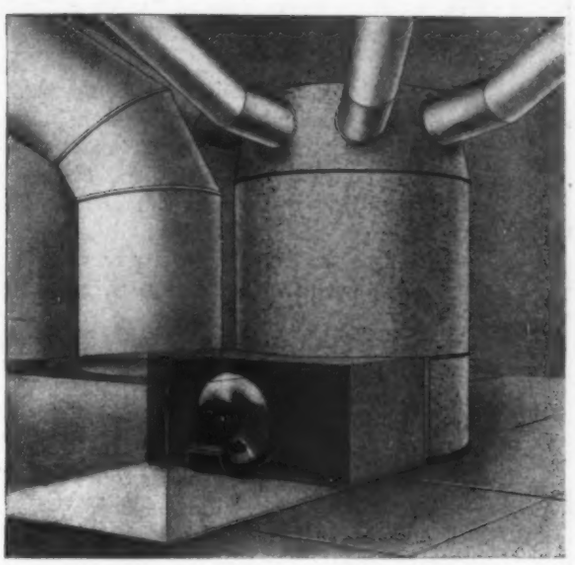
GLOBE

"Heat with AUTOMATIC FURNACE FAN forced air"

Progress with the industry — sell and install this simple, practical and highly efficient positive pressure system — and thwart the steam fitter's argument

FORCED warm air heating for homes has long been desired and the Automatic Furnace Fan now makes it an actuality because it is a positive pressure system — thoroughly practical, efficient and yet economical.

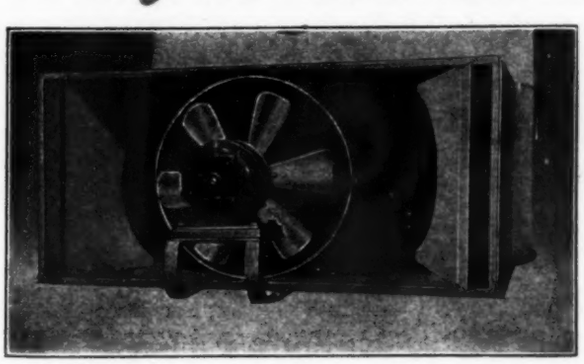
Increases capacity 60 to 100%, forcing a large uniform flowing volume of warm moist air to all parts of the house. It extracts all the heat units from the heating surface before they have time to go up the chimney. It saves coal and heats the home in one-fourth the time.



REMEMBER THIS—

IF YOU DON'T GET THE CONTRACT FOR FORCED AIR, IT WILL GO STEAM AT DOUBLE YOUR PRICE

Easy to install and it fits any furnace



THIS illustration shows the Automatic Furnace Fan when not running. It is a practical gravity system when not in operation, the by-pass louvers swing to a position parallel with the air, leaving a large free area for gravity operation. These louvers are balanced so they are normally opened but close by the pressure the fan builds up inside the chamber when in operation.

NOTICE the top illustration. The fan is in operation and the automatic by-pass louvers are swung to a closed position on each side of the fan, thereby shutting off all possibility of back pressure leakage. This patented construction insures positive pressure throughout the system — a necessary feature in successful forced warm air heating.

The Automatic Furnace Fan is extremely simple and fool proof. It is placed in the cold air duct in any make of furnace and it is compact and assembled in a single unit and easy to install.

MAKE BIG MONEY

and give your customers a real warm air heating plant by securing the sales agency for the Automatic Furnace Fan for your territory now.

WRITE TODAY for a COPY OF "HEAT WITH FORCED AIR"

It gives you some facts on this subject and it explains the operation and construction of the Automatic Furnace Fan in detail.

The MILES FURNACE FAN CO.

LEADER-NEWS BLDG.
CLEVELAND - - OHIO

A Plain Talk To
ALL FURNACE DEALERS

Emphasizing the fact that permanent success in business must be based on permanent satisfaction to the customer—and that, after all, a good article is worth its price.

A MAN who builds his business on a quality basis instead of on a price basis, is headed in the right direction.

Stop and think for a minute. You're dealing with a man who is building a home. This man does not want the cheapest roofing, the cheapest guttering, the cheapest sidewalks. When he selects a furnace, he wants a good one that will deliver lots of heat every winter for years to come without undue waste or excessive repair bills.

Such a man is ready to listen to quality arguments—and it's up to you to get the quality idea in your mind so that you can talk it successfully to him.

When you sell good furnaces and install them properly, you will not only satisfy your customers, but will make each satisfied customer a booster for you and your furnaces. He will help you sell many others.

A man building a home for his family will gladly pay a little more for a high-class heating plant when you can convince him of the comforts he will get from your furnace and your installation. He will be satisfied—glad that he paid a little more for a good job, and got what he paid for.

The day that you start selling quality and satisfaction you are starting to build your business on a profitable, permanent and successful basis.

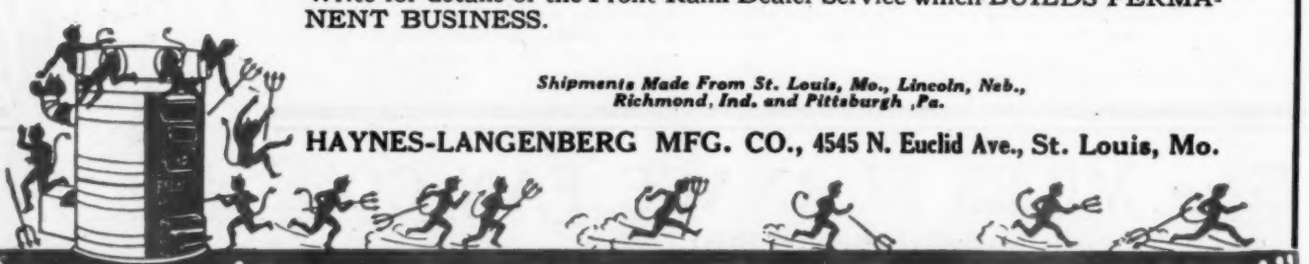
The leading dealers in almost every city recognize this principle—they refuse to sell or install a poor furnace simply to meet competition. They handle only such furnaces as they can personally guarantee—they seek and win the better trade—they get a better price for their furnaces and for their work of installing, and they have no come-back from the customer when the work is once done and done right. It is a pleasure and satisfaction to all concerned. The dealer is building a reputation for himself.

FRONT RANK
TRADE NAME REGISTERED

STEEL FURNACES

Every advantage that practical use has brought out in 35 years, has been built into the Front Rank. That is why any dealer, anywhere, any time can stake his reputation on a Front Rank job.

Write for details of the Front Rank Dealer Service which BUILDS PERMANENT BUSINESS.



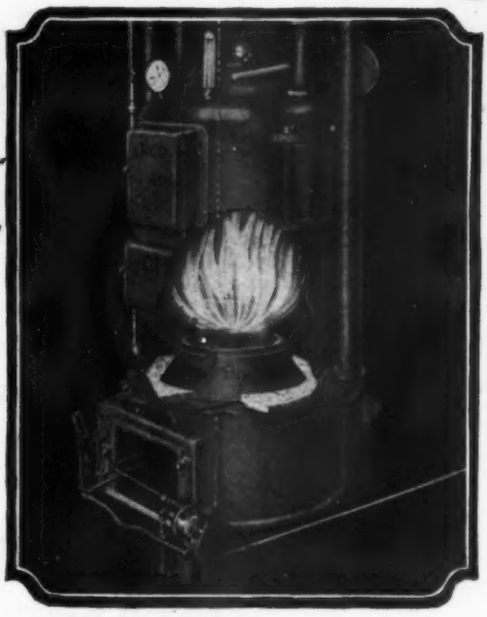
Shipments Made From St. Louis, Mo., Lincoln, Neb., Richmond, Ind. and Pittsburgh, Pa.

HAYNES-LANGENBERG MFG. CO., 4545 N. Euclid Ave., St. Louis, Mo.

"Good Bye! We're Going Home—Front Rank is too Hot!"

$5000 Extra for You Thru This Amazing Invention

There are 16 models of Oliver Burners to fit all hot water, hot air, or steam furnaces. Thermostatic equipment optional. Will outlive the furnace itself.



At Last! A Furnace Oil-Burner Every Family Can Afford

Sheet metal men, furnace and boiler dealers, supply dealers, and other men of influence who are in contact with home builders and home owners, have an extraordinary opportunity to make $2,500 to $5,000, and as high as $10,000 a year acting as distributors for the remarkable new Oliver Furnace Oil Burner. Every householder in America has been waiting for this invention—a real practical, efficient, furnace oil burner—without noisy motors, without electricity or any complicated machinery—**and sold at a low price.**

Twice the Heat of Coal

The Oliver Oil-Gas Burner for furnaces has been perfected to the point where it combines 95% air with 5% oil to produce an intense clean flame that gives twice the heat of coal if necessary.

No Expensive Equipment

This simple device without any moving parts, converts **any** furnace into an automatic heating plant. It maintains a steady, even temperature in coldest Winter weather. It can be quickly and easily installed. It is absolutely safe—lasts a lifetime.

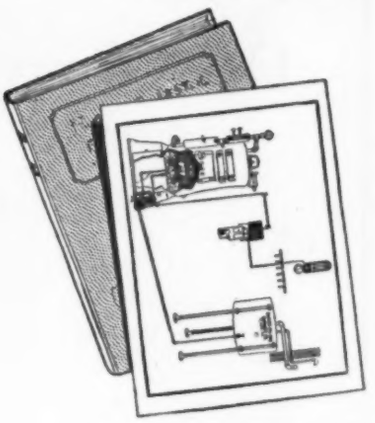
Perfect Heating Guaranteed

Home owners everywhere realize the wonderful convenience and economy of burning oil. Over 150,000 homes are now using Oliver Burners and their performance has been so thoroughly tested that they are sold under an extraordinary guarantee of complete satisfaction.

Mail Coupon for Attractive Offer

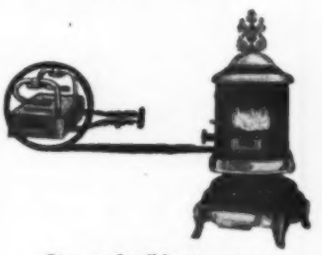
There is an established demand for this inexpensive oil burning equipment. Practically every person who is now building a modern home is thinking about burning oil for heat. We are the oldest and largest manufacturers of oil-gas burners in the world. By acting as our distributor, you have an opportunity for a large volume of business yielding an extremely attractive income, with only a reasonable amount of effort on your part. If you will mail the coupon below, or write us, we will be glad to tell you the details of our Exclusive Territory and open basis plans. We will send you working drawings and diagrams of the Oliver installation for every type of furnace. You can become our distributor on an extremely lucrative basis. Fill out and mail the coupon immediately.

Free



to Furnace and Supply Dealers and Sheet Metal Men

For a limited time we will send free installation diagrams and full information covering the installation of Oliver Burners in every type of furnace. You want to know all about this wonderful new furnace burner. Oliver burners are already installed in over 150,000 homes—they are manufactured and guaranteed by the oldest and largest manufacturers of oil-gas burners in the world.



Sizes to fit all heating stoves. Gives warm room at once—no waiting for fires to come up.

OLIVER OIL-GAS BURNER

OLIVER OIL-GAS BURNER COMPANY **A-128 Oliver Building, St. Louis, Mo.**

Oldest and largest manufacturers of oil-gas burners in the world.

Canadian Distributor **A-128 Oliver Building Toronto, Ontario, Canada**

Oliver Oil-Gas Burner Co.
A-128 Oliver Bldg., St. Louis, Mo.

Gentlemen: Please send me, free and without obligation, full details of the Oliver Burner for furnace and stoves, installation plans and full explanation of your distributor's plan.

Name .....

Address ..... Co. .....

City ..... State .....

( ) Check here if interested in a burner for your own home.

The Oliver burner makes any range a gas stove—on or off at turn of valve. Splendid for cooking and baking.

Patented Jan. 2, 1923

Do you want to double your sales?

JOHN M. REYNOLDS, of Tyrone, Pa., started a few months ago selling The New Victor Furnace, with Intercepting Heat Conveyors. (Patented January 2, 1923.)

Early in November he wrote us:

> I want to say to you the New Victor Furnace is the finest heater I ever set up, and I surely will do business with them next year. I want your heater to sell, as it has them all skinned a mile.
>
> I have been installing furnaces about 31 years. I have set up hundreds of them, and will say the New Victor is the best I ever set up. No place to collect soot or ashes. Just a new heater all the time.

Wins Sales by Real Merit

The New Victor Furnace which has been selling so fast for Mr. Reynolds, will bring in business that way for furnace dealers everywhere, because a radical improvement in radiator construction increases efficiency more than 20 per cent! Purdue University tests prove it. Yet the New Victor costs no more than any other good furnace.

Any aggressive furnace dealer can double his sales with this remarkably better furnace. We are increasing production 100 per cent for 1924. We have room for *exclusive dealers* who are qualified to *sell* as good a furnace as this one. Write for our catalog and dealer proposition now and handle The New Victor in 1924!

Hall-Neal Furnace Co.

1322 N. Capitol Ave. Indianapolis

Builder of Victor furnaces for a Quarter Century

NIAGARA FURNACES

YOU can make a good margin of profit selling these good quality furnaces.

They are made entirely of clean, high grade pig iron especially adapted for furnace making.

This metal expands and contracts without danger of cracking.

Durable, Efficient and Economical

Our catalog gives the details of their many features of construction — write for a copy today.

An unusually profitable proposition is waiting for you in our agency for 1923.

The Forest City Foundry and Manufacturing Co.

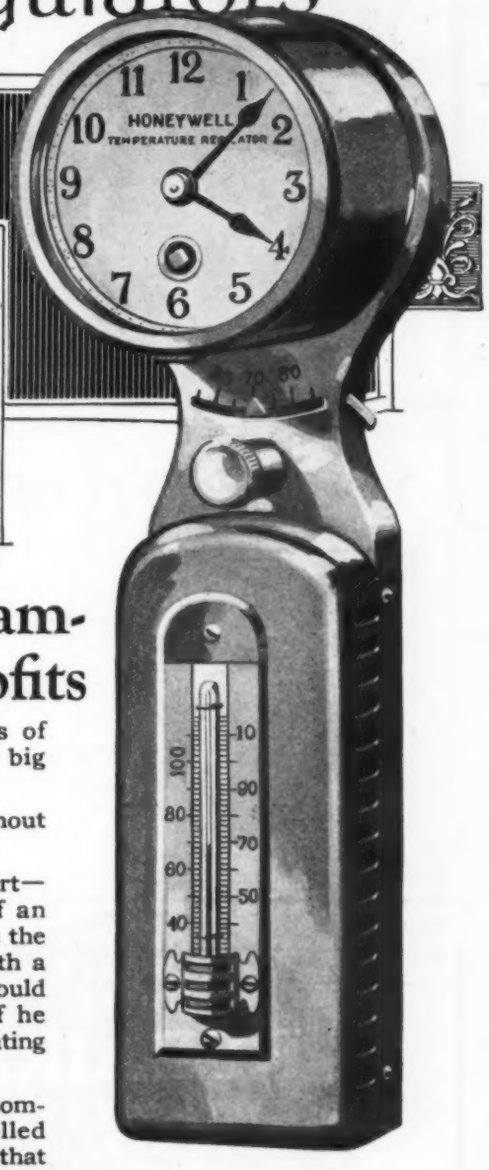
1220 Main Avenue

Cleveland, Ohio

We are also makers of the Monarch Furnace

HONEYWELL

Temperature Regulators



Honeywell Regulators are sold by American Radiator Co., U. S. Radiator Corporation, International Heater Co., Standard Sanitary Mfg. Co., Fox Furnace Co., Henry Furnace and Foundry Co., Majestic Furnace Co., Hall Gas Furnace Co., Pacific Gas Radiator Co., and many other manufacturers and jobbers.

Honeywell Regulators are used by Consolidated Gas Co., New York, American Nokol Co., Chicago, Detroit Edison Company of Detroit, United Utilities and Engineering Corporation of Lansdale, Pa., and a large number of others, as part of their service and equipment.

A House-to-House Comfort Campaign that Would Yield Big Profits

The stage is all set for the man who deals in devices for the automatic control of room temperatures.

Undoubtedly equipment of this nature offers the best opportunity for profit of any major heating essential.

The field is enormous and only a tiny portion of it has been covered.

The dealer who sells devices to control heat automatically is, primarily, selling comfort and comfort is the principal desire of the man who is building or buying a home.

There can be no comfort without warmth.

Warmth from artificial heat must be controlled automatically to yield the greatest degree of comfort.

Make a survey of your territory.

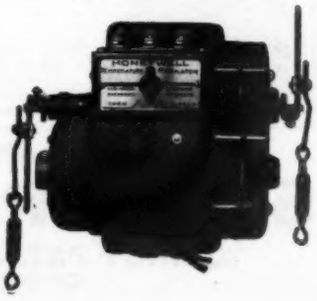
A house-to-house canvass of certain sections would pay big dividends.

Find out what homes are without temperature regulators.

Then sell the owner on comfort—more comfort by means of an automatic device that controls the temperature of his home with a precision and regularity he could not hope to approximate if he personally fussed with his heating plant every hour.

And when he is sold on the comfort of automatically controlled heat, then sell him on the idea that Honeywell Regulators will give it to him in the largest possible measure because they are superior in design and workmanship and are free from service needs.

The Honeywell Heating Specialties Company
Wabash, Indiana



The Honeywell 15-20 day Chronom Clock Thermostat, used in conjunction with the Honeywell new-type electric motor, is a development of fifteen years of experience and specialized effort in this field. It is distinguished for its numerous exclusive features of automatic control and its absolute reliability.

SCHEIBLE

Warm Air Heaters

YOUR customers, when they buy Scheible Warm Air Heaters from you, get more than they pay for and you get more than a mere cut and dried profit.

You get satisfied customers who boost their heaters, boost you and your business.

Let us send you our catalog and agency details.

SCHEIBLE-MONCRIEF HEATER CO.
2545 East 79th Street
CLEVELAND, OHIO

1. *Old-fashioned good quality, sound construction and time-tried features.*
2. *For over thirty years good business builders for our dealers.*
3. *Built to give unusually good service and liberal profits.*

YOUR PROFIT DEPENDS UPON THE PRICE YOU PAY

When you buy COLBURN HEATERS you get 100% HEATER—Eliminating 30% for UNNECESSARY OVERHEAD

WRITE FOR OUR PRICES AND NEW SELLING PLAN

COLBURN HEATER COMPANY
MARSHALLTOWN, IOWA

COMPLETE STOCKS — **PROMPT SHIPMENTS**

STOVE
FURNACE
BOILER
REPAIRS
NORTHWESTERN
STOVE REPAIR CO.
CHICAGO
The Oldest and Largest
We Can Save YOU Money
SEND FOR ILLUSTRATED BOOK OF ORDER BLANKS

ACCURATE SERVICE — **PRICES RIGHT**

STOVE BOLTS

WE are large producers of a first quality and are in position to make prompt shipments.

STOVE RODS

We are equipped to manufacture Special Bolts, Rods, Pins, Nuts and Rivets of every description.

STOVE RIVETS

Catalog and Prices upon application

THE KIRK-LATTY MFG. CO.
CLEVELAND, OHIO

Oval Stove Pipe Reducers

Reduce from 7 inches to 6 inches. They are made with a 7 inch oval bottom, which fits perfectly over the oval collar of stove or range and are reduced to 6 inches round top. They are used by all up-to-date stove dealers in preference to the 7 to 6 inch stove pipe.

Made of Uniform Color and Polished Steel

SULLIVAN-GEIGER CO.
501-509 Madison Avenue, INDIANAPOLIS, IND.

PATTERNS

FOR STOVES AND HEATERS — FIRST-CLASS IN WOOD and IRON
VEDDER PATTERN WORKS — ESTABLISHED 1835 — **TROY, N. Y.**

PATTERNS FOR STOVES AND HEATERS

THE CLEVELAND CASTINGS PATTERN COMPANY
CLEVELAND, OHIO

IRON AND WOOD

STOVE PATTERNS

QUINCY PATTERN COMPANY
QUINCY, ILLINOIS

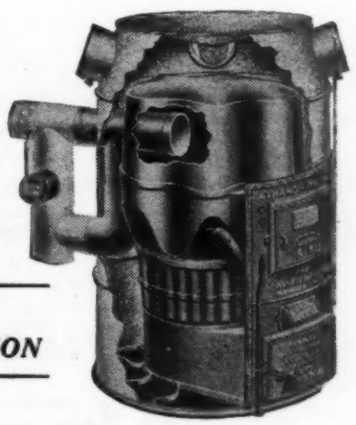
THE
PIPE AND ATH-A-NOR PIPELESS
FURNACE

Go after profits with a line of furnaces that possess—

QUALITY—EFFICIENCY AND SELLING FEATURES

The Furnace with the THREE-WAY AIR BLAST

Unusually Powerful, Efficient and Economical



NOTE THE CONSTRUCTION

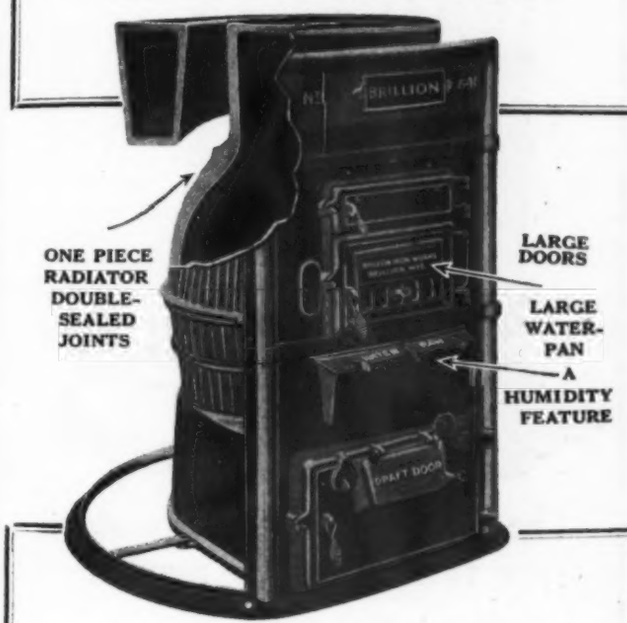
You want to sell this complete line. Our Agency is a real money maker.

***The* MAY-FIEBEGER FURNACE CO.**
NEWARK, OHIO

The BRILLION

PIPE FURNACE PIPELESS

EASY TO SET UP



A REAL FURNACE BUILT ON RIGHT PRINCIPLES

THERE'S real solid quality in this furnace, designed for correct heating and durability.

The sectional illustration of the Brillion above shows that the Brillion carries weight and thickness where it is needed. Notice also the extra deep close fitting double seal joints which insure perfect air tight seams.

ONE-PIECE, EVEN THICKNESS HEAVY, ALL CAST RADIATOR

The radiator on the Brillion being made in one-piece is free from possibilities of gas leaks and the process by which it gets its even thickness insures durability.

The great depth and wide air space provide extensive radiating surface.

The Brillion is noted for its large free air travel, economical service, all round durability, extra large water pan and for being constructed for the successful burning of hard and soft coal, coke or wood.

Sell this Quality Money-Maker Now

Get better profits by selling this better furnace, a furnace that satisfies and is easy to set up because of perfect fitting parts.

Write today for our prices and descriptive matter, which gives details of other Brillion features

BRILLION IRON WORKS

210-230 Park Ave., BRILLION, WISCONSIN

SIMMPLEX

Pipe and Pipeless

The most-remarkable standard type furnace on the market—

THE RADIATOR—is cast in one solid piece—made by a newly invented method which insures clean castings of uniform thickness with no chaplet heads or bumps appearing on radiator.

FEED SECTION—Double feed door equipped with gas-tight flanges. Large and roomy.

THE FIRE POT—is extra large with extra good height and is equipped with a brand new shaking device.

There are many other unusually good and important features on the Simmplex including The Patented Simmplex Grate, One-Piece Base with base ring attached, Large Water Pan and Large Cleanout door.

Let us tell you all about this extra good furnace and its quick-selling, profit-making price.

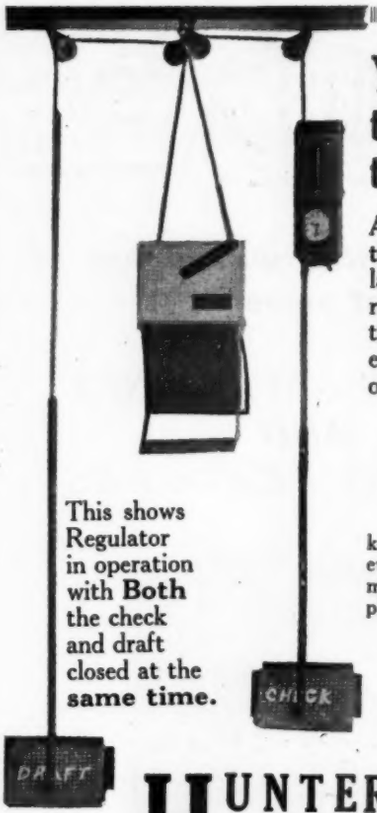
USE MANNY SPEEDY SERVICE IN GETTING HIGH QUALITY

FURNACES — REGISTERS
PIPE AND FITTINGS
AND ALL WARM AIR FURNACE SUPPLIES

WE CARRY ALL LEADING MAKES AND OUR PRICES ARE RIGHT

Drop a line today for complete catalogs, circulars and our attractive prices.

The Manny Heating Supply Co.
131 W. Lake St. Chicago, Ill.



This shows Regulator in operation with **Both** the check and draft closed at the **same time.**

You have seen the rest, now try the best

An improved regulator that absolutely regulates. It is the only regulator on the market that operates the dampers independent of each other.

The Improved MASTER Heat Regulator

keeps the temperature more even and positively saves more coal than anything yet placed on the market.

Get Full Information, Prices and Circulars now. It will make money for you.

HUNTER HARDWARE CO.

ROCKFORD, ILLINOIS

ATTENTION

STOVE AND FURNACE MANUFACTURERS

DO YOU MANUFACTURE A SPECIALTY?

IF not you do not excel which means price cutting and struggle to obtain possible business.

It is necessary to run your factory full capacity the entire year to make money. If you do not you are losing money and it will only be a short time until you will be forced out of business.

If you wish a maximum profit and have your choice of trade address Box XXX, care of American Artisan & Hardware Record, 620 S. Michigan Ave., Chicago, Ill.

Facts about Warm Air Heating

are contained in books listed and described in our 10-page book catalog.

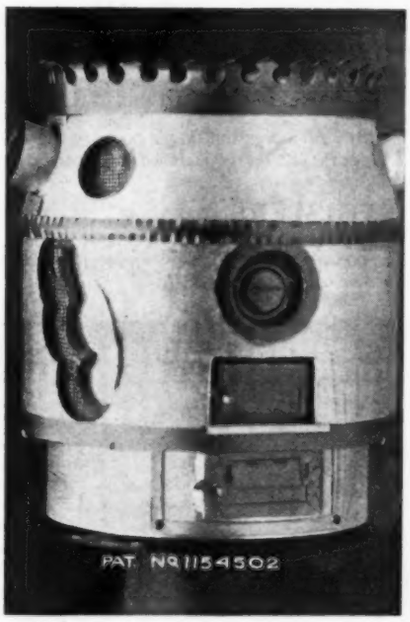
The books on Warm Air Heating cover every angle of the subject. You can find the book or books you are wanting to read.

A request brings our catalog by return mail.

AMERICAN ARTISAN AND HARDWARE RECORD
620 South Michigan Avenue CHICAGO, ILL.

FOX'S SAFETY FURNACE CASING

IS GOOD AS A GOLD BOND



FURNACE INSTALLERS LISTEN!

WITH the enormous amount of coal that is wasted every day, at the extra high price the consumer has to pay, it is up to you to help stop this waste. You can do it by installing FOX'S SAFETY FURNACE CASINGS on your new work and also on all the old work in your territory. It means a good business for you and a Godsend for your customer.

This is no experiment. It has been given a severe test for the past five years and can be sold on an Iron Clad guarantee that it will do the business. It prevents loss of heat by radiation through the furnace casing. It lessens the danger from fires caused by overheated furnaces. It saves the fuel because it saves the heat. By using this casing your furnace will deliver 30% more heat to the rooms.

I am offering this to Installers with a Shop License and full instructions for Five Dollars, this for the life of the Patent. This offer at this price good for sixty days.

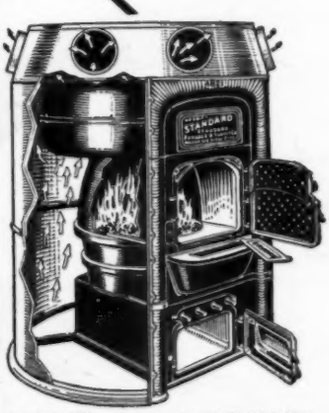
Yours for Service,

M. L. FOX

COLUMBIAVILLE, MICH.

QUALITY **CONFIDENCE**

SPEED AND SERVICE



NESBIT cast-iron FURNACE

95% of all our orders are shipped the same day they are received. Western dealers profit by this service which goes with Standard Supplies. We carry a complete stock of Furnace Supplies, Registers, Handy Pipes and Fittings, etc., at all times, and their quality is unquestionable. Catalogue on request.

WIER all-steel FURNACE

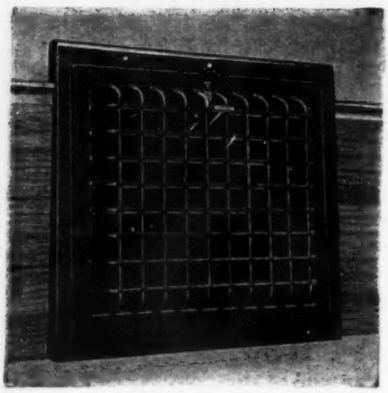
STANDARD FURNACE & SUPPLY CO.

OMAHA, NEBRASKA **SIOUX CITY, IOWA**

For Quality Specify—

WALWORTH

Registers and Gratings



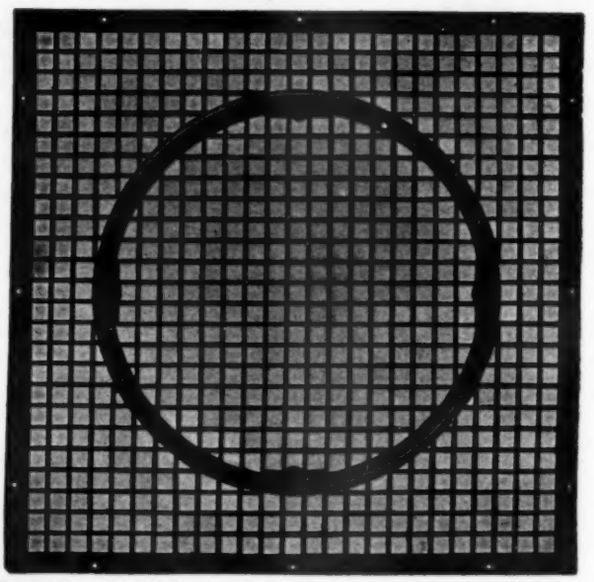
Win Satisfaction from your customers as well as profits with—

WALWORTH BETTER MADE REGISTERS

OUR registers both floor and sidewall have greater efficiency and larger capacity for a given size than any other make. They are strictly sanitary and can be fastened more perfectly and securely in less time than others, without the aid of tools.

WALWORTH WOODGRAINED REGISTERS have made a big hit with the trade. They are finished to give an exact reproduction of the wood, making it possible for you to harmonize the registers with the floor and woodwork. This finish can be had on floor, sidewall and baseboard registers. It will not tarnish or turn color.

Write today for circulars and price.



WALWORTH DOUBLE GRATING

BY far the most popular pipeless grating on the market.

If you want an extra high grade double grating at a reasonable price specify WALWORTH on your next order.

The design illustrated is our plain lattice design which can be had in seven standard sizes from 22x24 to 45x45.

We carry immense stocks and can fill orders of any quantity on short notice.

Write for catalog and prices on this grating.

WALWORTH CASING RINGS

Made of Steel

Guaranteed Exact Measurements and True Circles

WE make these casing rings high grade and perfect in every respect and fully guarantee them.

Our long experience and modern machinery enable us to make them to individual requirements, full or partial circles and with lugs for double casings and without lugs for single casings.

Write for full information and prices today.

Write today for our—

1924 catalog and prices

THE WALWORTH RUN FOUNDRY COMPANY

CLEVELAND, OHIO

HART MFG. CO., Louisville, Ky., *Southern Distributors*

Majestic Duplex Register Unit

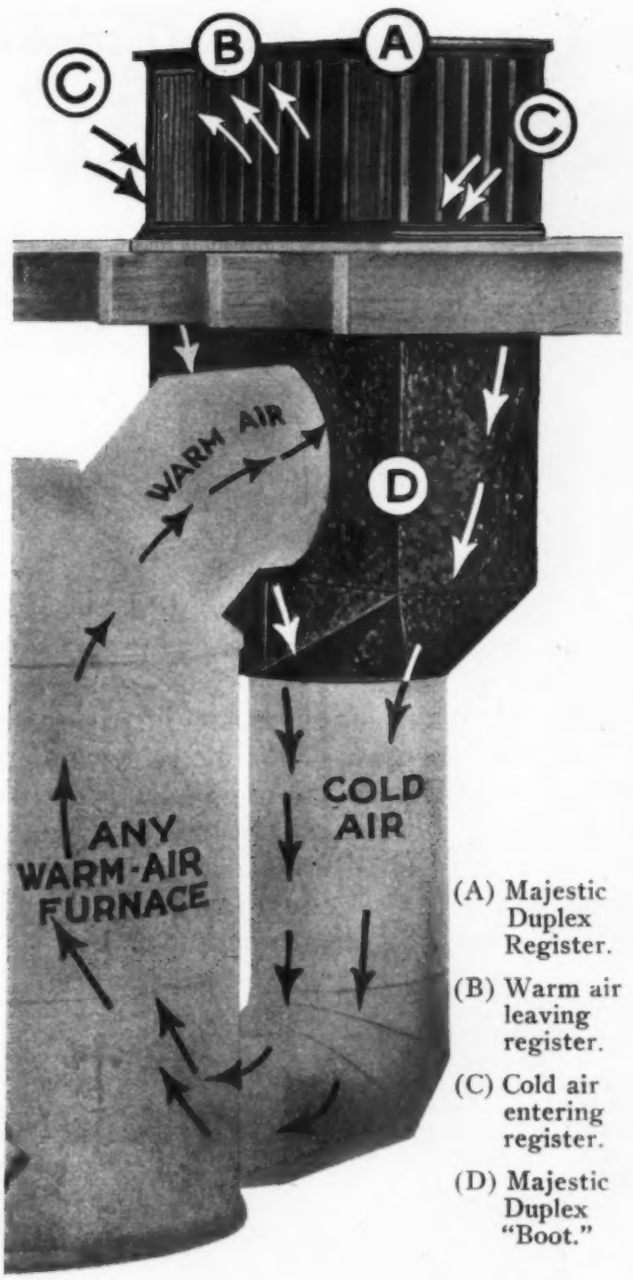
10 Reasons Why *You Can Sell It!*

1. Register locates against a wall out of the way.
2. Register harmonizes with room furnishings—the top and panels are in quartered oak, mahogany or craftsman leather finish.
3. Register occupies about one-half less floor-space than a floor-level register of equal capacity.
4. Avoids necessity for cutting hole in center of room — does not interfere with rugs.
5. Diffuses heat out into the room instead of shooting it directly to ceiling.
6. Circulates heat more evenly and reduces objectionable floor drafts.
7. Register is sanitary and clean—does not become a receptacle for dust and dirt from sweepings.
8. Does not limit furnace to one register, if you need others.
9. Makes furnace more efficient—insures maximum fuel economy.
10. Overcomes every objection to floor-level one register system.

Write for Booklet Now!

The Majestic Duplex Register Unit Is Endorsed and Sold by 35 Leading Furnace Manufacturers and Jobbers

THE MAJESTIC CO.
HUNTINGTON, INDIANA



(A) Majestic Duplex Register.

(B) Warm air leaving register.

(C) Cold air entering register.

(D) Majestic Duplex "Boot."

The complete Majestic Duplex Register Unit consists of a Duplex Register (A) and a Duplex Boot (D) with warm and cold air fittings. Majestic Duplex Registers are made in five styles, and are of all steel construction. They are shipped knocked-down and can be assembled on the job in five minutes. Write for prices, discounts and full information.

The greatest improvement ever made in
WARM AIR HEATING

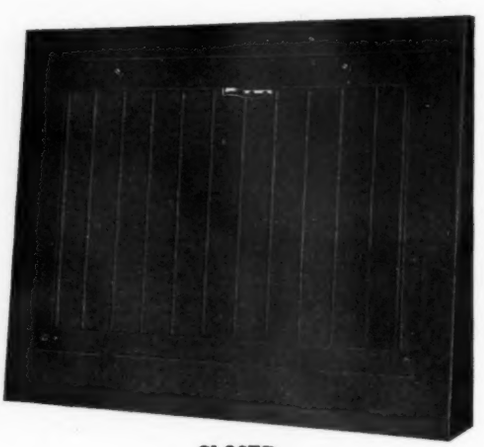
NEW STANDARD
STEEL BASEBOARD REGISTER

With Detachable Face

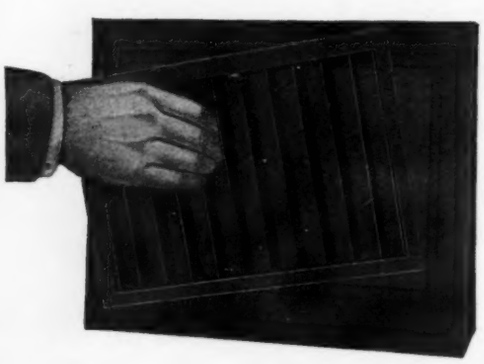
OPEN

WE call it the New Standard as it is made in sizes which conform to the code adopted by the National Warm Air Heating and Ventilating Association and will fit all standard stack heads.

THESE registers are made with detachable face, secured by two screws which will enable the mechanic to turn the edges of the box between the frame and the face if he so desires. The shutters are made of polished steel and are finished the same as the register and may be opened to any desired capacity. When opened there is very little air resistance and when closed has a beautiful panel effect which will appeal to a large majority of home owners.



CLOSED



THERE is no limit to the advantages for progressive jobbers and furnace dealers in securing this line. Jobbers will be able to give dealers goods that are right up to date which will enable them to standardize their stock, giving them selling advantages over the old style grill and wing register.

Furnished in all standard finishes.
Send for descriptive circular and price list.

Manufactured by

WATERLOO REGISTER COMPANY

WATERLOO, IOWA

Seattle, Wash.: No. 90 Blanchard St.

H&C REGISTERS

"The Air Capacity Line!"

A register is as good as its free air capacity.

For Example

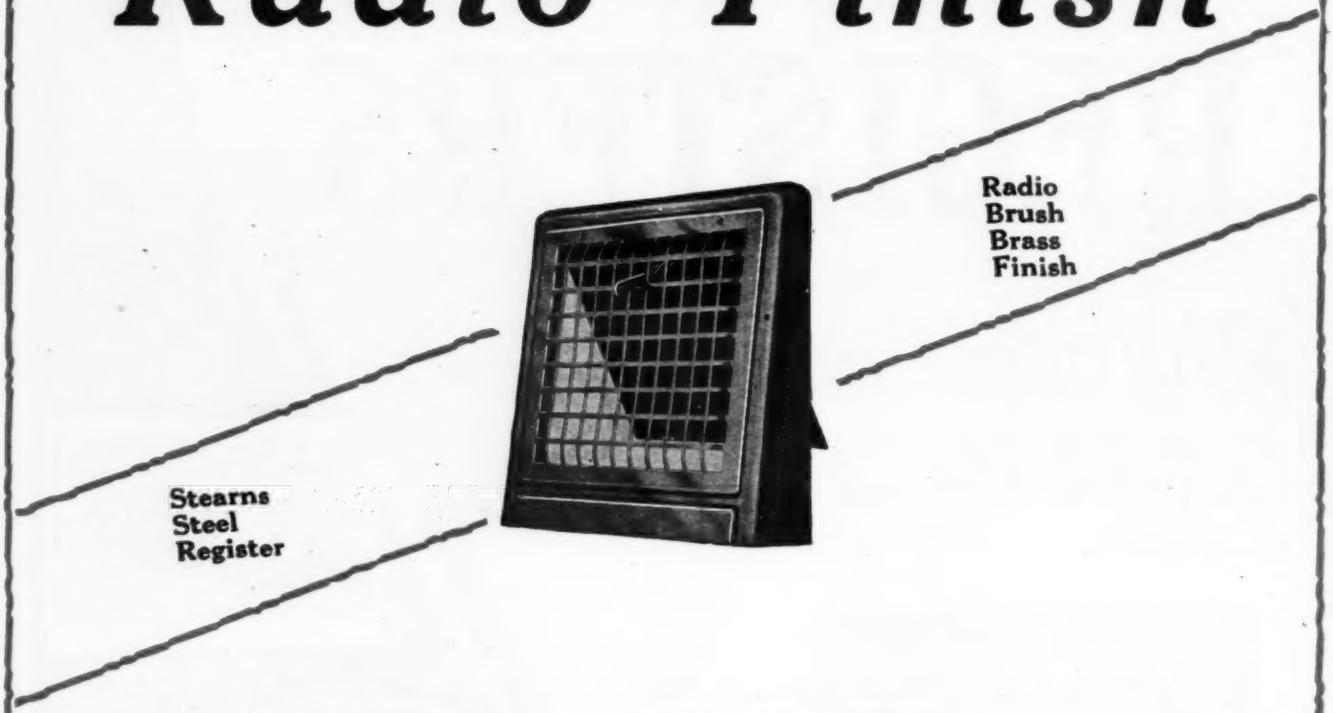
The area of a 10-inch pipe is 78 square inches. Free air capacity of an H. & C. 8 x 12 No. 170 is 81 square inches. Free air capacity other makes 10 x 12 is 65 to 70 square inches.

You Can't Get Away From Facts!

THE HART & COOLEY COMPANY
INCORPORATED
NEW BRITAIN, CONN.

NEW YORK PHILADELPHIA CHICAGO BOSTON

Radio Finish



Over Thirty-Five Thousand

homes are now equipped with Stearns Registers having the Ratchet Opening Lever.

It's the only sensible, practical and efficient register operating device on the market.

When you see the beautiful Radio Brush Brass finish which makes the register look like solid brass you will install Radio Brush Brass Finish registers on every job.

We don't want you to imagine how far superior Radio Finish is—we don't expect you to realize how good-looking, high-class and different it is without seeing it—you have to see it to know—that's why we say—

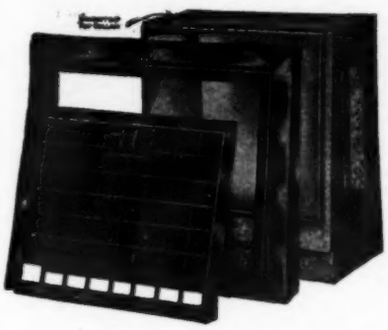
DON'T DELAY—WRITE TODAY FOR PARTICULARS

Stearns Register Company

617 East Fort Street **Detroit, Michigan**

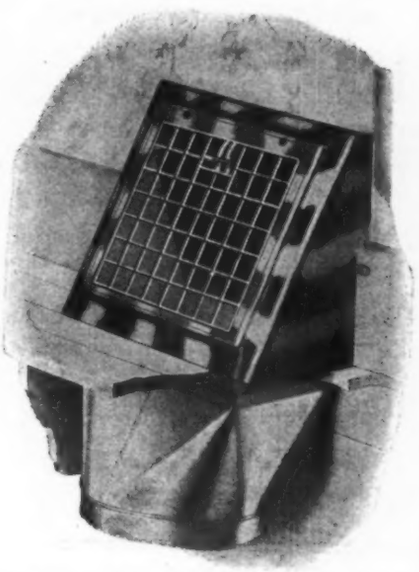
Mr. Jobber

are your Register Sales Satisfying?



ROCK ISLAND NO-STREAK

S A T I S F A C T I O N —



THE OUT-O-WALL REGISTER

can be summed in three Prime Requisites.

Profit — Low Handling Costs and Satisfactory Customer Service. These are the outstanding features of NO-STREAK and OUT-O-WALL Registers.

The first requisite depends on the other two and they are assured to you the same as our other Jobbers by the Increased Demand thru our Publicity Advertising and Customers' Guarantee.

Acquaint yourself with this profitable line to-day by mailing coupon to

ROCK ISLAND REGISTER CO.

ROCK ISLAND, ILLINOIS

Rock Island Register Co.

Send catalog and price to

Name.....

Address.....

A. A.

AUER REGISTERS

have perfect operating devices.

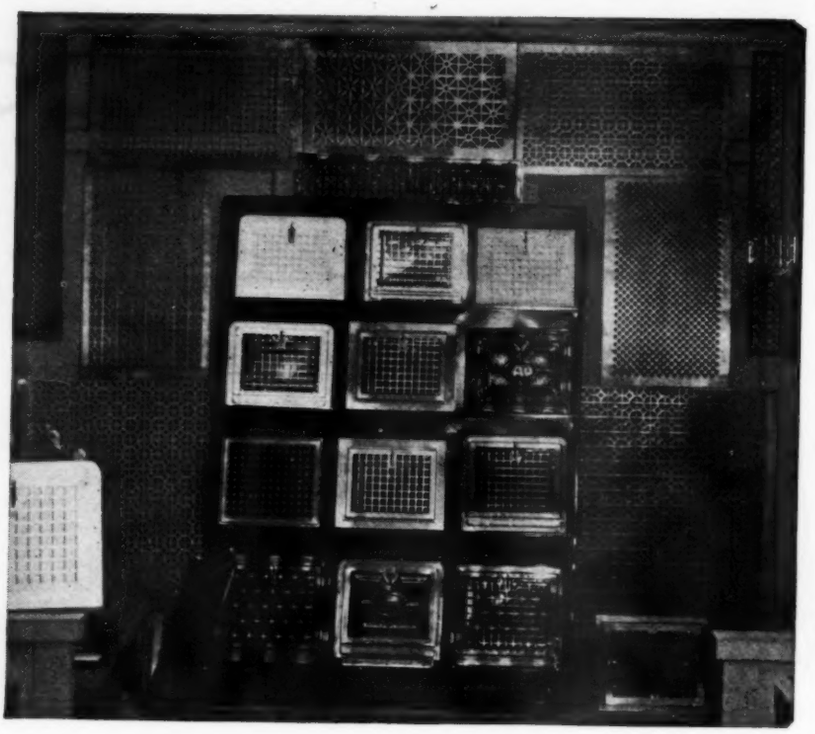
ART, COLONIAL and ECONOMY

Models Baseboard Registers, all fit the same boxes.

THIS year we have perfected an Oblong Mesh Cast Face, having large capacity, and which will not admit chair leg. Send for new catalogue.

We also make steel grilles, various designs, for radiator enclosures, schoolhouse and commercial building work.

Also an improved line of semi-cast and all-steel construction floor registers.



THE AUER REGISTER COMPANY

Ask For Name Of Nearest Jobber

Cleveland, Ohio

Read this newest edition of the best book written on Warm Air Furnace Heating

SNOW'S FURNACE HEATING

264 PAGES

PRICE $3.00

The man interested in better Warm Air Heating will get this book for himself and his employees—

Snow's Furnace Heating deals with the different types of furnaces, their construction, proper location and setting together with furnace fittings. It is the standard authority.

This new edition contains a chapter covering the main features of one pipe or pipeless furnace heating, which has become a big factor in warm air heating.

Contents—Furnaces: House Heating, Combination Systems; Air, Heating and Ventilation of School Buildings; Heating of Public Buildings, Churches and Stores; Fan Furnace Combination System; Temperature Control; Estimates and Contracts, Fuels; Miscellaneous Tables and Data; Furnace Fittings; Miscellaneous Notes, from Various Sources on Furnace heating.

For full information on any book on Sheet Metal Work or Warm Air Furnace Heating address BOOK DEPT.

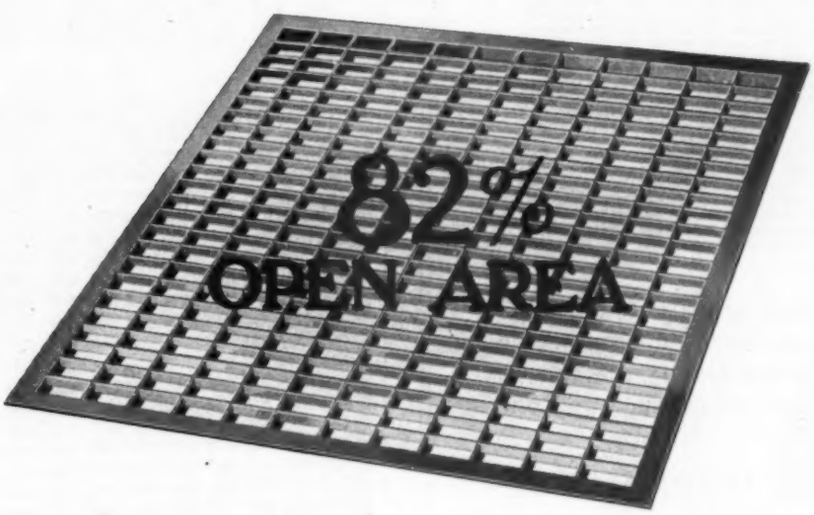
ASK FOR A COPY OF OUR 10-PAGE BOOK CATALOG.

AMERICAN ARTISAN AND HARDWARE RECORD

620 South Michigan Avenue - - - CHICAGO, ILLINOIS

Independent "Fabrikated"

Register Faces
Pipeless Furnace Gratings

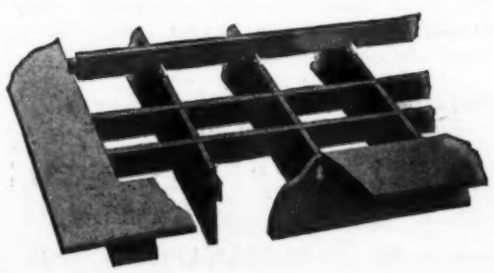


ALL sizes have a uniform actual open area of approximately 82% comparable with from 50 to 70% found in the usual patterns of Faces and Gratings. Thus a smaller size of "Fabrikated" Face or Grating may be used to secure the same open area or the same size will give much greater capacity.

Why Buy a Large Size When a Smaller One Will Perform the Same Service?

Independent Register & Mfg. Co.

742 Superior Ave., W. Cleveland, Ohio

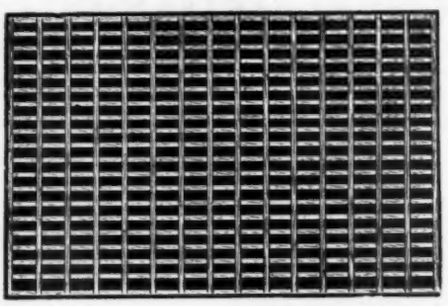


Construction:

The outer frame of angle iron, the grill formed of strip steel one-eighth inch wide, in varying depths to one and a half inches, depending upon the size of the face, all fabricated into uniform squares with openings $\frac{7}{8}$x1$\frac{7}{8}$ inches. The strips are securely interwoven and the frame corners welded.

No Breakage

AMERICAN WOOD REGISTERS



WE produce one article only and have produced only one article for the last twenty years so we should know how to produce that one article.

That one article is AMERICAN WOOD FLOOR REGISTERS. We study American Wood Registers all the time wherein to make them better, that is why American Floor Faces set the STANDARD.

The very best of material is used in the manufacture of AMERICAN WOOD REGISTERS and our men are experienced in making this good material into good wood registers.

Try AMERICAN WOOD REGISTERS and you will always use them. The profit on them is greater than other makes extending over a period of time.

We are now making up sheet stock and standard sizes, which insures giving our customers prompt shipments this spring when the season opens. Now is the time to order your stock which can be shipped at a future date.

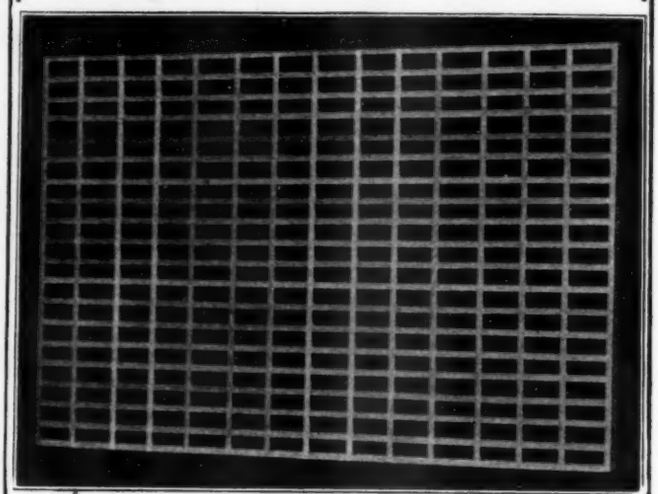
THE AMERICAN WOOD REGISTER CO.

PLYMOUTH, IND.

Eaglesfield

Extra High Grade

Wood Faces



There are three things that a heating contractor should look for in wood faces.

1. Free Air Capacity

Wood faces to be satisfactory must have the proper amount of free air capacity. Eaglesfield faces are made with the openings 1 5/8 inch by 7/8 inch. Compare this with those you have been using and see if they allow enough air.

2. Strength

Eaglesfield faces to have sufficient strength are made with the cross pieces 7/16 inch deep, which is 1/8 inch deeper than those in the ordinary faces.

3. Appearance

In Eaglesfield wood faces one finds the finest white quartered oak obtainable and unexcelled workmanship. This results in a product of fine appearance.

Obtain these things by using Eaglesfield Wood Faces

EAGLESFIELD VENTILATOR CO.

"Sudden Shippers"

916 Dorman St. INDIANAPOLIS, IND.

"The quality pipe of mechanical perfection"

Kwik-Lok
FURNACE PIPE AND FITTINGS

The snappiest and most secure locking device.

The longest connecting joint of any pipe on the market, with the inner and outer section each in one continuous piece—

A heavier, sturdier pipe of highest grade material—

Turned out perfectly by special machinery and skilled workmen—

You'll use Kwik-Lok if you once get your hands on it—

Let us send you a few sample sections without obligations, together with catalog and prices.

"The House of Service"

THE Dunning Heating Supply Co.

131-133 REED STREET - - - MILWAUKEE, WISCONSIN

AUGUST 8, 1908, Handy Pipe received its patent papers at Washington.

It was the *first* one-tongue, self locking furnace pipe to be made. A new idea produced by this 50 year old business house and the beginning of better furnace installations.

And today after sixteen years on the market thousands of warm air heating contractors point to it and say it is still first in quality, construction, durability and efficiency.

They bank on Handy Pipe—they point out its features and qualities to customers and to their employees. They rest assured (and they well may) that Handy Pipe will never fail them. They know that in Handy Pipe they can get pipe for *any* furnace installation—they *know* that they can get it *at once* from big stocks from their nearest jobber or us, also that we are always ready to serve them expertly supplying estimates on complete installations.

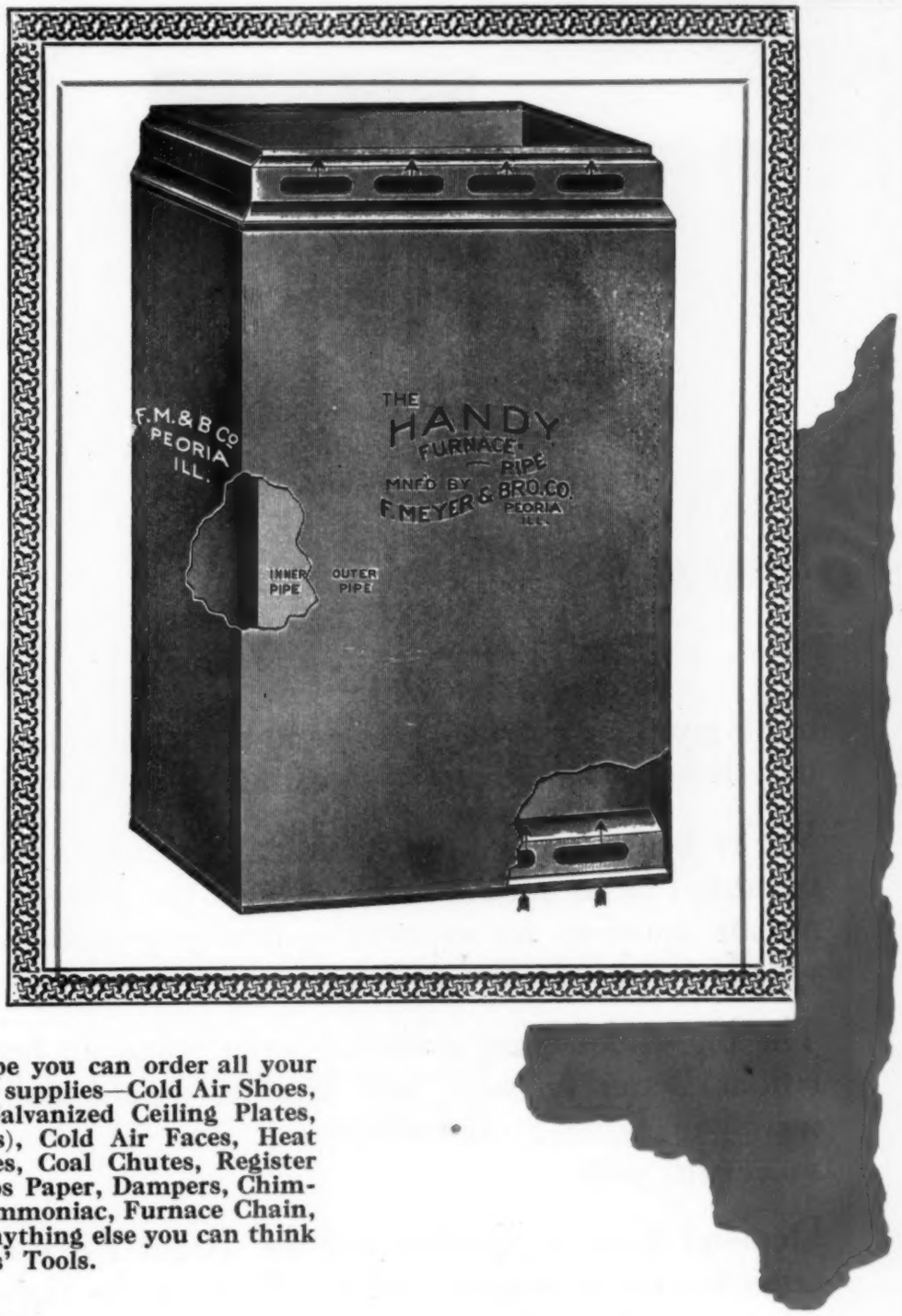
We appreciate this confidence.

Handy Pipe costs no more than others—our immense volume of sales is the reason.

F. MEYER
PEORIA

HANDY

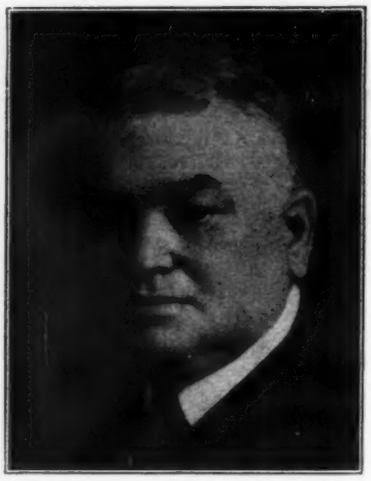
Read the story of Handy Furnace Pipe. Write for Catalog No. 43 TODAY



AND—with Handy Pipe you can order all your furnace installation supplies—Cold Air Shoes, Casing Bonnets, Galvanized Ceiling Plates, Registers (all kinds), Cold Air Faces, Heat Regulators, Wood Faces, Coal Chutes, Register Shields, Grilles, Asbestos Paper, Dampers, Chimney Caps, Speco Sal Ammoniac, Furnace Chain, Furnace Cement and anything else you can think of, including Tinsmiths' Tools.

& BRO. CO.
ILLINOIS

PIPE



I just want to say—

HAPPY NEW YEAR

to all my friends in the Trade and thank them for the business they have given me the past year and the many years gone by.

We've had extra good business in nineteen-twenty-three and because I'm an optimist and because the boys working with me are optimists we expect this new year to be a still better year for both you and us.

The big strides being made in better warm air heating installations, better furnaces and supplies should make every live warm air heating contractor start now to plan for a more successful year.

Demand Service, Quality and the Right Price and give the same to your customers and you'll be on the right track for a prosperous New Year.

Geo. B. Carr

FURNACES — REGISTERS — FITTINGS
AND ALL WARM AIR HEATING SUPPLIES

CARR SUPPLY COMPANY

412 North Dearborn Street Chicago, Ill.

"There is Our Sales Force"

"But how," said a recent visitor to our plant, "have you secured such wide distribution and enjoyed your remarkable growth with such a small sales organization."

The president turned and opened a door leading into the factory. The visitor followed. "There," said he, pointing to the men at work, "there is our sales force."

Not a man looked up. Busy hands and minds continued at their work. Lathes hummed, wheels turned and belts sped on. Each man, in office, factory or shipping room, was intently engaged at his work. Each was a Lamneck salesman. Each was driving home a sales argument for Lamneck Simplified products.

Design, right materials, precision in workmanship, promptness of delivery and courteous relations with our customers—these are the factors instrumental in the growth of The W. E. Lamneck Company. These are the factors that are meaning greater profits for our distributors from coast to coast.

Convince Yourself

Let us convince you of the superiority of our products. Catalog, prices, samples and further information are free for the asking Drop us a line.

THE W. E. LAMNECK COMPANY
416 DUBLIN AVENUE, COLUMBUS, OHIO

LAMNECK PIPE AND FITTINGS

The FANNER Furnace Poker

FANNER
STOVE & FURNACE
Trimmings

WE cannot show you all the Fanner Trimmings nor can we list them all in this space. These are just a few picked at random.

We operate our own Malleable and Gray Iron Foundries, and make the most complete line of highest grade finely finished Stove and Furnace Trimmings on the market.

Quality and Service.

Original distinctive designs and real durability are what you demand. We can meet your demands with utmost satisfaction.

Let us show you what we mean.

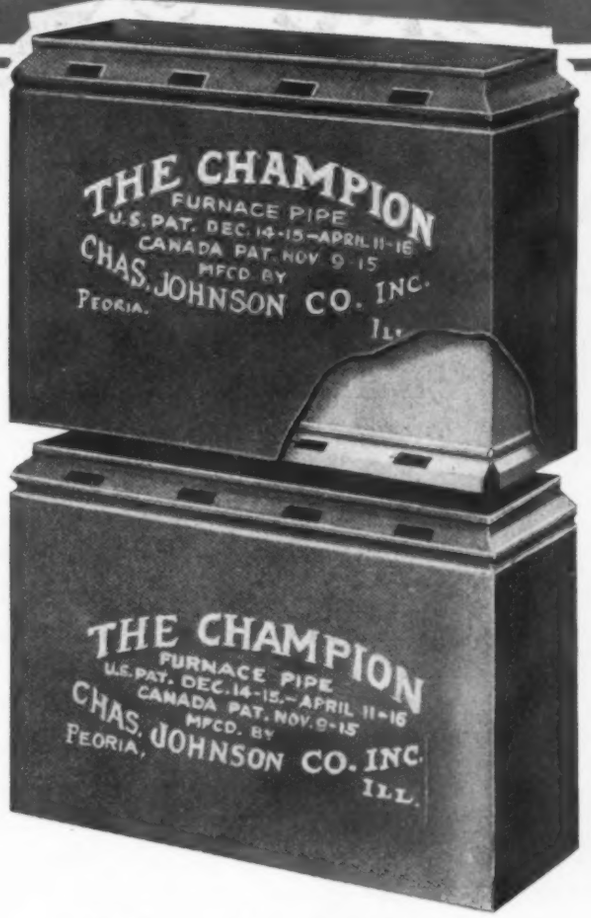
Write today for complete illustrated catalog and prices.

THE FANNER MFG. COMPANY
BROOKSIDE PARK CLEVELAND, OHIO

We have the trimmings you want

Write today for complete catalog

The CHAMPION FURNACE PIPE-FITTINGS



It wins every time!

because

It's the strongest, fastest and most perfect fitting furnace pipe made.

YOU want your stacks solid, safe and you want to get them up in the shortest possible time.

The Champion's inner and outer walls are double seamed together at both ends—that makes it substantial. It is easy to install and it won't come apart—absolutely no soldering required.

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WARM-AIR HEATING

Founded 1880 by Daniel Stern

Thoroughly Covers the Warm Air Furnace Sheet Metal, Stove and Hardware Interests

AMERICAN ARTISAN and Hardware Record

Address all communications and remittances to AMERICAN ARTISAN AND HARDWARE RECORD 620 South Michigan Avenue CHICAGO, ILLINOIS

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Index of Contents
Warm Air Furnace Special

	Page
Editorial—What of 1924?	61
Random Notes and Sketches, by Sidney Arnold	62
Make Full Use of Research Work, by E. B. Langenberg	63
1924 Can Be Made Red Letter Year, by Allen W. Williams	63
Pipe Installations Will Win Out, by John Pierpont	64
Harry Hussie Urges More Efficient Installations	65
Seabrook Mentions Some Things Not Yet Thought of	66
Professor Willard Tells About Research Residence	67
Professor Hoffman Puts Responsibility on Installer	69
George Harms Sees Plenty of Business in 1924	70
Better Merchandising Necessary, by Irving L. Jones	71
W. H. Hill Says Business Must Be Sought For	71
L. J. Mueller, Jr., Does Not Offer Any Advice	72
Heating Versus Bidding, by Harry Van Bayse	73
Jim Doherty Says Courtesy Helps a Lot	74
Two Important Requirements, by E. C. Fox	74
Buck Taylor Discusses Price Competition	75
Forced Air Heating, by J. C. Miles	76
Know and Believe in Your Furnace, by R. B. Monfort	78
Meston Sees Prosperous Year Ahead	79
Standard Code for Warm Air Furnace Installations	80
Professor Stewart Cites Facts and Figures	84
Service at Fair Profit Brings Success, by Roy C. Walker	90
Installation Plan for Factory	91
How a Bad Furnace Job Was Made a Good One	92
Make the Demand for Better Business, by Brown & Doyle	94
"Trow" Warner Wants Better Registers Used	97
Duplex Register Installation	98
An Ingenious Pipeless Installation	100
Better Work and Fair Prices, by F. G. Sedgwick	101
Triple Setting of Furnaces	102
A Typical Installation for Typical Home	104
How Follow-up Letters Sold an Installation	106
A Twin Installation for Two-Family House	108
Oil Burner Manufacturer Tells of Development of That Industry	119
Bryce Talks About Fuels and Fans	123
How Utica Home Owners Learned About Difference Between Good and Bad Furnace Work	126
Making a Furnace Hood, by O. W. Kothe	130
Helpful Information for Sheet Metal Men	132
Hardware Department	136
Selling Stoves and Ranges in January	141
Advertising Criticisms	143
Markets	144

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2. Year installed.
3. Tons of coal used per season.
4. Photograph of building.
5. Signed testimonial from the owner with permission to use for advertising purposes.
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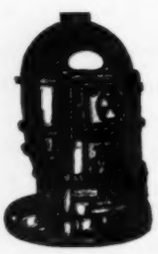

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WE will pay you $50.00 if you will send us the record of the oldest International, Carton, Kernan, Pease, Howard or Wheeler-Palace Heater.

In addition we offer Four Cash Awards of

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Go over the list of old installations, your cleaning and repairing lists and pick out the heaters which have given the longest service. It will only take a few minutes of your time and

Remember—there are five Cash Awards. Put one of them in your pocket!

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☐ We are interested in Cash Awards for oldest heaters.
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Name..... *Address*.....

.....

1923 WAS A GOOD YEAR FOR MOST FURNACE MEN. WHAT OF 1924?

When our readers receive this issue 1923 will have passed into history, so far as business is concerned, even though a few hours may still remain of the old year.

With comparatively few exceptions, furnace manufacturers and furnace installers, as well as those who make the various fittings and appliances that form a part of a well installed furnace, have reason to feel gratified with conditions in the industry:

First, 1923 has been a good year for those who went after business in a manner that insured a fair profit.

Secondly, progress has been made in the fundamental factors upon which the stability of the furnace industry depends. The Standard Code is being followed as a "standard" of installation by a steadily increasing number of installers. Price-cutting competition is being recognized more and more as a form of competition which brings neither temporary nor lasting benefit to anybody. "Service" is today accepted as the keystone of business success to a far higher degree that it ever was.

Thirdly, the Educational Research Work of the National Warm Air Heating and Ventilating Association, has been rounded out by the decision to build an Educational Research Residence in which furnaces and accessories can be tested under actual true-to-life conditions, and thus be made of more practical value to the average installer who is not trained along what is commonly regarded as "scientific lines."

Now as to prospects for 1924:

First, with all the information at hand, it is reasonably safe to predict that there will be at least as many furnaces made, sold and installed as was the case in 1923.

Secondly, by sheer force of example, makers and installers of warm air heating apparatus will do less and less of the sort of competition which is based upon price solely and base their search for business more and more on the very tangible something which is known as "Service."

Thirdly, and in a way the most important of all, there is every probability that an Educational Research Bureau will be established under the auspices of the National Warm Air Heating and Ventilating Association, the province of which will be to carry the gospel of healthful heating by warm air to manufacturer, installer, architect, builder and home owner and occupant.

In view of all these good things, it is easy to see why this Warm Air Furnace Special is the greatest issue that has ever been published in this field, containing as it does a wealth of helpful, inspirational information on warm air heating and more advertisements, in number and total pages, than any similar publication has ever published in one issue.

We are proud to have been permitted to fill an important place in the line-up of the forces which are working toward the general recognition of warm air heating as the most efficient system of heating for residences and many other classes of buildings, and it shall continue to be our endeavor, as it has been in the past, to help point out the way toward our common goal.

* * *

Business conditions, as viewed by men who are in position to know the trend better than most of us, are such that the hardware and stove merchant, the sheet metal contractor and the furnace installer may with reasonable security prepare for a good year.

There will be in some sections a scarcity of ready cash, owing to poor crops or low prices of farm products, but even in those localities will it be worth while to make a specific and aggressive effort to secure business, with proper credit arrangements, of course, because even there will the bulk of buying be done with those who are prepared to serve and who show by such efforts that they are alive and up and doing.

The sluggard always complains about poor business, but the man who really goes after it seldom has time to complain and—what is more to the point—he rarely has reason to complain about poor times.

* * *

Read every page in this issue.

Random Notes and Sketches.

By Sidney Arnold

In 1924 we shall elect a President of the United States, a lot of Representatives and some Senators.

Sometimes I get the notion that it would be a good stunt to make it a condition of a Representative's election that he must stay at home all the time and not introduce a single bill during his term—and the same regulation for Senators.

Seriously speaking, however, here is a suggestion to you men who make and sell furnaces, sheet metal, machinery, stoves and tools and all the other things that are used and sold in typical, progressive hardware stores and sheet metal shops:

"A presidential year" is just as good for business as you make it!

I have just read an article in the *Nation's Business,* entitled "Why Fear a Presidential Year?"

My opinion is that while it has a punk title, the article brings out a very good point—

That presidential elections have nothing to do with the matter of prosperity and business profits.

This is proved by going back over the elections since 1880—covering eleven "presidential years."

1880—Business was 10 per cent above normal;

1884, nearly 15 per cent below normal;

1888, practically normal, growing better in second half;

1892, about 10 per cent above normal;

1896, over 10 per cent below normal;

1900, improved from 5 per cent below to 5 per cent above;

1904, practically normal;

1908, from five per cent below normal to five per cent above, conditions starting to improve several months before election;

1912, nearly 10 per cent above normal;

1916, between 10 and 20 per cent above normal;

1920, from 20 per cent above to 20 per cent below normal, growing worse toward election.

Look over that list again, and see if you can find any logical reason for figuring that 1924 is going to be good or bad, simply because it is a "presidential year."

But you can make it a good year for yourself.

* * *

A special grand jury which has been at work for more than a year in Chicago has just been discharged, not because there was no more for it to do, but because, forsooth, "political conditions are such that it would be useless to pursue the investigation," as the report of the body bluntly puts it.

Many will say that Chicago is rotten—more rotten than almost any other city or community.

Possibly it is, but most likely it is not.

I have lived in and visited many other places, and in few have I failed to find corrupt politicians holding sway and feeding at the public crib. More flagrant in some places than in others, to be sure, but the rule holds good, that the American business man is too lazy to pay any attention to the affairs of the community in which he resides and makes his living.

It is not because he has no time to take an active interest in "politics," for he wastes more time in one day than it would take to check up on all of the men who come up for election once a year, and if he really wants to he can find plenty of time to go out and work for the decent, efficient man who may have been put up against the man whom everybody knows is unfit, morally or otherwise, to hold office of public or private trust.

And remember this—

There never was a grafter without a man who was willing to pay the graft in order to gain some improper advantage.

And there always will be grafting, so long as the average decent, honest business man refuses to give some of his time and attention to "practical politics."

I have no patience with the man who kicks about rotten political conditions of his town and does nothing else.

Honesty in public life will not be the rule until the big majority of us who really want to have honest men serve us as public officials make it our business to see that the crooks are kicked out and kept out.

But that takes work—and work is something that too many of us dislike.

* * *

I am not vouching for the truth of this item which is reproduced from a Wisconsin newspaper. I do not know Mr. Saunders, nor have I ever heard of the town, but that does not disprove this statement. In fact, I am prone to believe that mostly any ill-luck may fall to the lot of a hardware merchant who is not converted to the value of an association membership. Should this come to the notice of Mr. Saunders I want to assure him that through the organization, he could have secured sage advice on every point, which would have prevented each and every mishap:

Unluckiest Man in Wisconsin

Henry Saunders, hardware merchant of Belfield, Wisconsin, claims he is the unluckiest man in the state. Recently he was selected judge in a "prettiest ankles" competition held at a charity benefit affair. The women stood behind a curtain with their ankles showing. In spite of the protests of the other judges Saunders declared the "second from the end" possessed the most shapely ankles. The winner turned out to be an old sweetheart of Saunders, and the one getting second place was his wife, whom many said should have had first place. Saunder's wife left him as a result of the contest. Then the husband of the winner blacked both of Saunders' eyes in a fight. Added to this, his hardware store and automobile burned, neither being insured.

President Langenberg Urges Installers to Make Better Use of Information Now at Hand.

Research Work Carried on at Urbana, Illinois, Is Bringing Out Definite Data for Furnace Installers.

IN the following statement, E. B. Langenberg, of the Haynes-Langenberg Manufacturing Company, and President of the National Warm Air Heating and Ventilating Association, urges warm air furnace installers to take the full advantage of

E. B. Langenberg, President National Warm Air Heating and Ventilating Association.

the Research Work which is being carried on at Illinois University under the auspices of that Association:

What of 1924?

To progress to the extent that every ambitious man wants to do, those of us in the heating business whether we be manufacturers or installers, will profit materially from the mistakes of 1923.

To call attention to some of these mistakes might remind us all of some of the things that we can prepare against recurrence during 1924. The first things to consider are the careless promises that have been made when selling a job. We have intimated that we would do more than we could do for the price consideration; secondly, we have not estimated capacities nor have we consistently followed the Code in a conscientious way; thirdly, we have not collected our bills as promptly as we should and fourthly, we have not taken care of our just complaints promptly and efficiently.

Every one knows that the neglect of the four above main subjects costs money and we should resolve to strive and strain that these things do not occur in 1924.

It is well to remember that "good goods" well installed will demand a good price and generally secure prompt pay.

It is only the conscientious dealer who strives to give the public the best possible service who survives the present day rush. People do remember good service and tell their friends about it, and a good customer is one of your best salesmen who works without pay. One likes to have as many friends as possible and be well thought of and why wouldn't it be a good idea to make your customers friends and boosters for you.

The developments in the Research Work that the National Warm Air Heating and Ventilating Association are carrying on have already passed the experimental stage and this information is rapidly becoming available to the installer. The failure to make use of this will eventually class him as a "has been."

Too much credit cannot be given the men who had the foresight to establish this Research Work knowing as they did that the information so obtained would be available without cost to every manufacturer, dealer and consumer in the world.

Look back over 1923 and say to yourself: "Johnny Jones, I forbid you to make the same mistakes in 1924 that you made in 1923 and I am going to be on the job every minute to see that you mind your boss who is me, Johnny Jones."

Secretary Allen W. Williams Reviews Warm Air Furnace Industry and Predicts Further Growth.

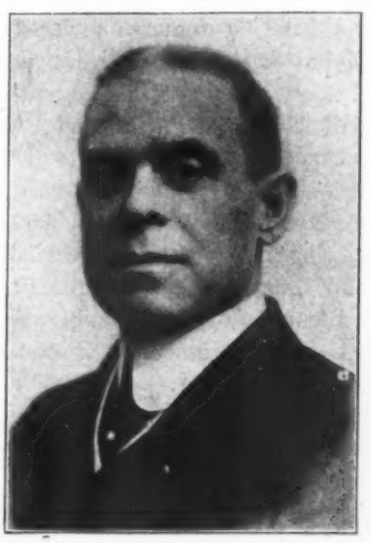
Developments in Research Work at Illinois University and Starting of Educational Campaign Point to Banner Year.

IN THE following, Secretary Allen W. Williams, of the National Warm Air Heating & Ventilating Association, reviews the warm air furnace history of 1923 and predicts a normally busy year for 1924:

As each year draws to a close and we reach the threshold of a new one, it is always timely and profitable to review the twelve months that have passed and consider what the future apparently has in store.

For several years the Warm Air Furnace Special issue of your publication has admirably reflected the situation in our industry that it has become a splendid point of contact between the manufacturer and the dealer.

Those engaged in the Warm Air Furnace Industry, either as manufacturers or installers, have reason, on the whole, to feel encouraged as to the results of 1923 and the prospects for 1924.



Allen W. Williams.

The number of units sold during 1923 represents a gratifying growth in the industry. The only fly in the ointment is the fact that profits are still too slender. The interest displayed by manufacturers and dealers in the effort which has been made throughout the year to popularize our method of heating and to give it the dignity and prestige which it deserves should bear fruit during the coming twelve months, but 1924 will also be a year in which to build for the future.

We cannot read the future with certainty to be sure, but when all things are considered, it seems safe to predict at least a normal trade and a still further increase in the popularity of the warm air furnace as well as its accessories, many of which possess great merit and help materially to make the heater itself more satisfactory and efficient.

It is reasonable to expect some falling off in the home building during 1924 as compared with 1923, but even at that the statistician for F. W. Dodge Corporation estimates it will not amount to more than 9 per cent. If such is the case, we have little to fear as to an outlet for our goods which will be made during the coming year, for stocks in the hands of both manufacturers and installers are low and the opportunity for replacement will be greater.

During 1923 the Research Work of the National Warm Air Heating and Ventilating Association made much progress and will be continued during 1924. The same organization will also give special attention to Educational Publicity.

There is no question but what 1924 can be made a red letter period for warm air heating.

John A. Pierpoint Says That Pipeless Furnaces Will Ultimately Be Replaced With Pipe Jobs.

President of National Association of Sheet Metal Contractors Sees Bright Prospects for Furnace Installers.

BIG John Pierpoint made such a good President of the National Association of Sheet Metal Contractors in 1922 that they re-elected him last summer, and what he has to say about the furnace business is well worth reading:

Bright Prospects for the Pipe Furnace In the Next Few Years.

I have, at some time, heard the saying that there are tigers in Asia that, once having tasted human flesh, will have no other kind; which seems to apply to hundreds of those whose have tried the pipeless furnace and have had the satisfaction of getting heat in homeopathic doses, and found that they were afforded some relief, if the family was not too large to assemble at one time near the register.

Most of these people live in the suburbs or rural districts, and were used to the old portable stoves, and having installed a pipeless furnace and found that they have a different temperature in each room, anywhere from 40 degrees to 90 degrees, at the breathing line, and that the nearer they were to the register, the colder their feet would get, have decided that when the time for repairing the pipeless furnace comes it will be repaired by a pipe furnace, so as to have heat in every room and overcome the cold air draft on the floor; or in other words, having acquired the taste for furnace heat, they will not be satisfied until it is placed in the different rooms where it should be.

There is no record of the origin of artificial heat, the first, perhaps, being that of the volcanoes, or lightning, which were only destructive at best. But we do read that two thousand years ago the Romans built flues through portions of their homes to heat certain parts of the house; after which came open fireplaces and portable stoves. Then the pipe furnace, which will continue to remain for years to come, owing to its advantage over all other heating methods, offering as it does, the healthful supply of fresh air which is essential to our existence. And the change from the pipeless to the pipe furnace is only another evolution from crude to the enlightened sane method of heating.

John A. Pierpoint, President, National Association of Sheet Metal Contractors.

Installers Find Fan in Cold Air Duct Great Aid to Circulation.

In order to ascertain the extent to which temperature regulating devices on warm air furnaces are being used, and the popularity of fans in the cold air ducts of warm air furnaces, two questions in the AMERICAN ARTISAN Warm Air Furnace Special Questionnaire to installers were devoted to this subject.

Eighty per cent of those who answered the questions advocated the use of automatic temperature regulating devices. A few, however, stated that the cost was too large and their patrons would not stand it.

Sixty-six per cent had made no use of the fans in the cold air ducts. The 33 per cent who had made such use of fans reported unanimously that the fan was a big improvement in assisting circulation.

The man who lets success turn his head will be looking backwards.

Harry Hussie Recalls Start of Warm Air Furnace Industry and Urges More Attention to Installations.

Secretary of Western Organization Claims Credit for His Association for Putting Pep Into Move for Improvement.

LAST summer Harry Hussie was so sick that everybody thought he was going to die—except Harry. And that he is very much alive right now is evident from the following article written by him as Secretary of the Western Warm Air Furnace & Supply Association:

The Western Warm Air Furnace & Supply Association is "An Organization Devoted to the Upbuilding of the Warm Air Heating Industry."

Just how far it has progressed in carrying out this laudable purpose might perhaps be a debatable subject, but certain it is that, were it not for the work done by the various associations of those connected with the industry, the furnace business would today be in an unenviable condition.

While the making of furnaces was confined to a few manufacturers and installations to a few dealers, the business drifted along without attracting much attention, but when it became necessary for all new buildings to be equipped with some kind of heating plant and even old houses became unrentable without a furnace, the construction of furnaces and the manner of installation became a more serious matter.

A Black Eye for Furnace.

It was not, however, until careless construction and improper installations gave to furnace heating the reputation of being fit only for low-priced houses and cheap renters, that manufacturers and dealers awakened to the fact that if the warm air furnace was to take its proper place in the heating industry an organized effort toward improvement in manufacture and in installation must be made. This led to the foundation of the organizations in this line now in existence, and it may be stated conservatively that the results justify their being.

The furnace business is growing very rapidly and improvement in methods is apparent everywhere.

Through the Middle West a large percentage of furnace sales to dealers is made through jobbers or wholesalers, and the Western is the only association that includes jobbers as well as manufacturers in its membership.

From the first it has stood for everything that would in any way

Harry Hussie.

advance the quality of warm air heating plants. Better furnaces, better fittings and better installations.

What Western Has Done.

A Standard Code for installation and standardization of everything that enters into a heating plant are two of the things the Western Association has fought for from the first, and it is encouraging to be able to say that these things are in the way of accomplishment.

Interest in the Standard Installation Code is growing daily among furnace installers. Inquiries for copies are received from all parts of the country, and in many cases it is stated that it is the intention to incorporate the furnace code in city building laws.

Manufacturers in general are doing all they can to educate the men who install their product and assist them to become experts in their line, but I am sorry to observe that there are still a few manufacturers who seem to cling to the old antiquated idea that their duty ends when they sell a furnace.

Salesmen Must Be Better Posted

Many traveling salesmen do not know how to figure the size of a pipe or a register required for a certain room or building. How, then, do they expect their retail agents to qualify as experts? If I were a manufacturer I would insist that every salesman in my employ learn the Standard Code from cover to cover and use it on all occasions, and I would strongly urge my customers to install my furnaces in accordance with its terms.

We have only started on installation improvement and we must not sleep on the job.

I stated a year ago that in my judgment the price of the farmer's product and the price of skilled labor and manufactured articles were too far apart, and that the price of farm products must come up or manufactured articles come down. I think the past year has proved that I was right.

The farmer, however, is, I believe, getting into much better shape financially than he was a year ago, and that is a very encouraging indication of what next year's business may be. We must all remember that upon the prosperity of the farmer in this Middle West hinges the prosperity of the entire country and perhaps the entire world, and it behooves us to pull for his success.

Let the slogan of the furnace industry be, "Good Furnaces, Good Fittings, Good Installation, and Educational Publicity."

Have you noticed your outside store sign lately? Does it need paint? Is there a sign down where people passing close by the store front will see it? Is there a sign visible at night?

Secretary Seabrook Touches On Some of the Features of Warm Air Furnace Not Yet Thought Of.

In His Whimsical Way the National Secretary of the Sheet Metal Contractors Points Out Pertinent Points.

AMONG the sheet metal contractors one name is known from coast to coast, and that name has for years been associated with everything progressive in the industry, so what Secretary Edwin L. Seabrook, of the National Association of Sheet Metal Contractors, has to say to the furnace installer will be read with interest:

Hard to Tell What Furnace Will Do.

Consider the illusiveness—or shall we say the secretiveness—of the warm air furnace. It hesitates and balks about giving up the secrets of its power to make its owners comfortable. It displays the same tactics in refusing to disclose its reasons for sometimes making them uncomfortable. It is certainly a sphinx in both respects. It has confounded its makers in many things—that is, those who are really seeking to ascertain whether its limitations in generating heat have been reached. If its makers do not care whether any improvement can be made it assumes the same attitude and patiently does the best it can with the materials its makers put into it. It never complains nor protests. It does challenge science and the best engineering skill and that challenge has been accepted.

There is nothing common or coarse about the warm air furnace. It will stand a good deal of abuse and while there is any portion of it left it will do its work. When it comes to yielding its secrets, it puts itself in a class extraordinary.

Nothing but the very latest, most delicate, sensitive instruments known to heating will be recognized and some of these must be specially made. At Urbana, Illinois, the furnace has been put through a course of training with the idea of having it make a proper debut into heating society. They have done a lot in that training school, learned a lot about the pupil, spent quite a sum on its outfit, but it is not ready yet to be presented, which is another sample of its illusiveness.

Some generation-old theories and practices have been scrapped—that is, by the progressive kind. No sooner is some little secret discovered than it is seen that this one is not perfect in itself but is tied to

Edwin L. Seabrook,
Secretary, National Association Sheet Metal Contractors.

something else which must be pried open. The deeper engineering skill goes, the greater the illusiveness, the more profound the secret, and louder the challenge to come on and discover.

We Are Learning, However.

Now seriously, is not one of the first problems of the warm air heating industry to determine from the highest scientific standpoint just what a warm air generator can be made to do? Have science and heating engineering skill developed the present day furnace, or like Topsy in "Uncle Tom's Cabin," did it just grow? Has its flexibility, the ability to operate under the most adverse conditions, put it in a class thought perfection within itself and no changes or testings necessary? It was operating—what more is needed! If there is any such thought in the heating industry, it is fast becoming extinct.

The possibilities of the warm air furnace as a heat generator have hardly been surface scratched. The research work at Urbana is to be intensified rather than relaxed. That furnace construction can be changed to generate more heat can hardly be questioned. Incidentally, let no one get the idea that perfection has been reached in any other heating system.

Out of the research work planned at Urbana will be developed principles and methods of generating more heat from a pound of fuel than ever before. Much more might be said about the work at Urbana, but what has been done is only an indication of what is coming. The warm air furnace will yield its secrets to science and engineering skill.

Percentages Show Pipe Furnace Popularity Greater Than Pipeless.

The extent of the popularity of the pipeless warm air furnace was very well illustrated by the questionnaire of AMERICAN ARTISAN sent to manufacturers. The question asked was, "What is the proportion between your sales of pipeless furnaces and your total sales in number of furnaces?"

Forty-eight per cent of those manufacturers who returned the questionnaire replied that from 1 to 20 per cent of their sales were pipeless; 24 per cent showed percentages ranging from 20 to 40 per cent of their total sales to be pipeless furnaces; 16 per cent reported that from 40 to 60 per cent of their sales were pipeless furnaces, while 12 per cent gave 60 to 90 per cent as the percentage of total sales which were pipeless.

These figures indicate that the pipe furnace is still ahead in popularity by a considerable degree.

Curious as it may seem, one manufacturer said: "We do not advocate the use of pipeless furnaces; they were wrong from birth, although we manufacture them."

Professor Willard Discusses Principal Purposes of Educational Research Residence.

Tests of Furnace Capacity and Efficiency Can Be Made Under Actual House Conditions.

AMONG furnace manufacturers the name of A. C. Willard has come to be regarded as synonymous with absolute facts and definite figures pertaining to furnace performance.

It is due in a large measure to Professor Willard's intelligent planning and careful investigations that the furnace industry stands today on a far higher scale than even ten years ago, and it is safe to say that with the completion of the Educational Research Residence still greater progress will be made.

Professor Willard outlines in the following some of the purposes which this residence will serve:

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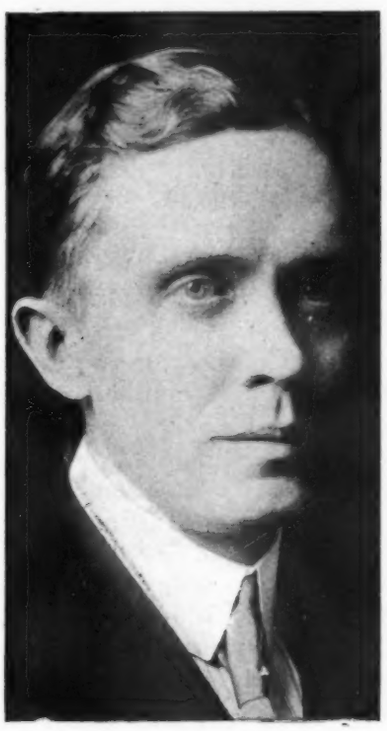
First of all, operating tests of a furnace heating system conducted in such a house will make it possible to compare and correlate the results of tests of furnaces which are now being made in the laboratory with the results obtained on the same furnace under actual house conditions. It has been suggested from time to time that the furnace efficiency, capacity, and general performance as found in the laboratory might be different from that which would be obtained in a house installation. The research house will make such comparisons possible and positive.

There are certain performance factors of vital interest to the manufacturer and installer which we cannot determine in the laboratory. Some of these factors are:

(1) The effect of wind on the proper circulation of the air to those rooms which are on the windward side of the house. The study of this problem will develop the true value of tight windows, double sash and metal weather strips in furnace heating.



Professor A. C. Willard.

(2) The relative value of inside and outside air supply to the furnace. It has been stated many times that a material saving in fuel results from using all inside air, that is, recirculating the air in the house, instead of taking cold air from outside directly into the furnace. How large is this saving? Do the actual savings, if any, check with the computed savings? Outside air supply may result in a better operating head since this air is colder than air recirculated from the house. Are smaller pipes possible as a result of this increased head?

(3) The importance of and the proper degree of humidity which should be maintained in a furnace heated house. Does a reasonable relative humidity make it possible to carry a lower air temperature in the house with comfort? Does this condition actually result in a saving of fuel or not? Can you properly and successfully humidify houses with windows of single glass which are often not tight, so that the water vapor is lost as fast as supplied by the humidifier, or must you use double sash or weather strips to stop some of the leaks and prevent condensation on the cold glass?

(4) The effect of outside cold walls on air circulation and the temperature variation from floor to ceiling in actual rooms. It is well known that there is a great difference in heating systems in respect to the range in temperatures between floor and ceiling. Direct radiators in a room with much cold outside wall may create a large difference in temperature between floor and ceiling, and yet maintain a satisfactory breathing line temperature. *Hot-air* furnace systems do just the same thing. At what air temperature at the inlet registers to a room do these temperature differences become serious?

(5) Effect of location of warm air furnace in the basement on the successful heating of the house. Is a location to the north and west, or favoring the worst exposure as important as it would seem, or would a more central location do as well or better?

(6) Effect of return air ducts below the floor entering a pit under the furnace, as compared with return air ducts run above the floor and entering casing above base ring. Does the extra operating head really give any advantage when the additional length of duct and extra elbows are taken into account?

(7) Proper location and arrangement of the register or registers for recirculated air in a system using all inside air. This item is a very important one and may vitally affect

Secretary Seabrook Touches On Some of the Features of Warm Air Furnace Not Yet Thought Of.

In His Whimsical Way the National Secretary of the Sheet Metal Contractors Points Out Pertinent Points.

AMONG the sheet metal contractors one name is known from coast to coast, and that name has for years been associated with everything progressive in the industry, so what Secretary Edwin L. Seabrook, of the National Association of Sheet Metal Contractors, has to say to the furnace installer will be read with interest:

Hard to Tell What Furnace Will Do.

Consider the illusiveness—or shall we say the secretiveness—of the warm air furnace. It hesitates and balks about giving up the secrets of its power to make its owners comfortable. It displays the same tactics in refusing to disclose its reasons for sometimes making them uncomfortable. It is certainly a sphinx in both respects. It has confounded its makers in many things—that is, those who are really seeking to ascertain whether its limitations in generating heat have been reached. If its makers do not care whether any improvement can be made it assumes the same attitude and patiently does the best it can with the materials its makers put into it. It never complains nor protests. It does challenge science and the best engineering skill and that challenge has been accepted.

There is nothing common or coarse about the warm air furnace. It will stand a good deal of abuse and while there is any portion of it left it will do its work. When it comes to yielding its secrets, it puts itself in a class extraordinary.

Nothing but the very latest, most delicate, sensitive instruments known to heating will be recognized and some of these must be specially made. At Urbana, Illinois, the furnace has been put through a course of training with the idea of having it make a proper debut into heating society. They have done a lot in that training school, learned a lot about the pupil, spent quite a sum on its outfit, but it is not ready yet to be presented, which is another sample of its illusiveness.

Some generation-old theories and practices have been scrapped—that is, by the progressive kind. No sooner is some little secret discovered than it is seen that this one is not perfect in itself but is tied to

Edwin L. Seabrook,
Secretary, National Association Sheet Metal Contractors.

something else which must be pried open. The deeper engineering skill goes, the greater the illusiveness, the more profound the secret, and louder the challenge to come on and discover.

We Are Learning, However.

Now seriously, is not one of the first problems of the warm air heating industry to determine from the highest scientific standpoint just what a warm air generator can be made to do? Have science and heating engineering skill developed the present day furnace, or like Topsy in "Uncle Tom's Cabin," did it just grow? Has its flexibility, the ability to operate under the most adverse conditions, put it in a class thought perfection within itself and no changes or testings necessary? It was operating—what more is needed! If there is any such thought in the heating industry, it is fast becoming extinct.

The possibilities of the warm air furnace as a heat generator have hardly been surface scratched. The research work at Urbana is to be intensified rather than relaxed. That furnace construction can be changed to generate more heat can hardly be questioned. Incidentally, let no one get the idea that perfection has been reached in any other heating system.

Out of the research work planned at Urbana will be developed principles and methods of generating more heat from a pound of fuel than ever before. Much more might be said about the work at Urbana, but what has been done is only an indication of what is coming. The warm air furnace will yield its secrets to science and engineering skill.

Percentages Show Pipe Furnace Popularity Greater Than Pipeless.

The extent of the popularity of the pipeless warm air furnace was very well illustrated by the questionnaire of AMERICAN ARTISAN sent to manufacturers. The question asked was, "What is the proportion between your sales of pipeless furnaces and your total sales in number of furnaces?"

Forty-eight per cent of those manufacturers who returned the questionnaire replied that from 1 to 20 per cent of their sales were pipeless; 24 per cent showed percentages ranging from 20 to 40 per cent of their total sales to be pipeless furnaces; 16 per cent reported that from 40 to 60 per cent of their sales were pipeless furnaces, while 12 per cent gave 60 to 90 per cent as the percentage of total sales which were pipeless.

These figures indicate that the pipe furnace is still ahead in popularity by a considerable degree.

Curious as it may seem, one manufacturer said: "We do not advocate the use of pipeless furnaces; they were wrong from birth, although we manufacture them."

Professor Willard Discusses Principal Purposes of Educational Research Residence.

Tests of Furnace Capacity and Efficiency Can Be Made Under Actual House Conditions.

AMONG furnace manufacturers the name of A. C. Willard has come to be regarded as synonymous with absolute facts and definite figures pertaining to furnace performance.

It is due in a large measure to Professor Willard's intelligent planning and careful investigations that the furnace industry stands today on a far higher scale than even ten years ago, and it is safe to say that with the completion of the Educational Research Residence still greater progress will be made.

Professor Willard outlines in the following some of the purposes which this residence will serve:

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Professor A. C. Willard.

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(7) Proper location and arrangement of the register or registers for recirculated air in a system using all inside air. This item is a very important one and may vitally affect

the success of any recirculating system. Some of the conditions which should be studied are merely mentioned in the following:

Effect of location of cold air return register

(a) in hallway,
(b) near outside wall,
(c) with two or more on first floor,
(d) for two-story (2 family) house,
(e) with trenched return,
(f) with boxed joist returns,
(g) with return registers in side wall,
(h) with outside air supply.

(8) Effect on heating of any room of the location of the warm air inlet registers. In the case of first floor rooms there are at least three possible locations:

(a) In the floor,
(b) In the baseboard,
(c) In the side wall, either high or low.

In the case of second floor rooms there are usually two possible locations:

(a) In the baseboard,
(b) In the side wall just above baseboard.

A register placed high in the side wall of a first floor room may solve a difficult location problem and at the same time materially increase the flow of air and heat to the room. How much is the increase in a given room for such a register location?

(9) Effect of installation details on the operation of wall stacks to second and third floors. In this case we already have a great deal of data from laboratory tests, but as was stated at the beginning, it is most essential that we correlate these data with results obtained in an actual installation. The details which require study are:

(a) Best and most practical ratio of stack area to leader area.
(b) Limitations of studding spaces, both for 4-inch and 6-inch studs.
(c) Offset stacks and fittings.
(d) What effect has height on stack capacity?
(e) The value and importance of insulation.

(10) Effect of installation details on leaders, or the warm air pipes in the basement.

(a) Pitch or grade of basement pipes.
(b) Short and long runs.
(c) Friction caused by elbows in leaders which cannot be run straight.
(d) The value and importance of insulation.

(11) Relative value of an inside chimney which runs up through the center of the house compared with an outside chimney at the end of the house. In each chimney there should be one fire clay tile-lined flue and one plain brick flue. What allowance in draft should be made when an outside chimney must be used? Does the flue lining pay?

(12) Effect of maintaining constant temperature day and night as opposed to normal temperature by day and lower temperature at night.

(13) The case of the remote room with three sides exposed, and the room in the attic demand special study. Can the former be dealt with successfully by using larger leaders and stacks, or should it be equipped with storm windows or metal weather strips? The attic room should be easy to heat if we know the correct heat loss. What are the losses from such rooms and how computed?

(14) What should be done with a sun porch? Can it be heated along with the rest of the house? Should it have a separate return air duct?

Finally, the house will afford a most unusual opportunity to check up many of the requirements of the new Installation Code, and most imimportant of all, it will provide a positive means for securing check data on the total heat loss from a house as well as from the individual rooms. Plans and elevations will appear in AMERICAN ARTISAN AND HARDWARE RECORD in a few weeks.

An old weather-beaten sign may be indicative of age and conservatism, but are those the qualities people look for first in seeking a place to trade?

Furnace Installers May Well Adopt This Same Idea.

An advertisement in "Radiator," the organ of the St. Louis Chapter, American Society of Heating and Ventilating Engineers, calling attention to "certified heating," as furnished by the Heating and Piping Contractors' St. Louis Association, is explained as follows in a recent number of the "Radiator." As stated in the advertisement, the phrase means the installation of plants reviewed and certified correct by the association's engineer:

"The Heating and Piping Contractors' St. Louis Association realized that a deplorable condition existed in the heating field on account of the various methods or, perhaps, lack of methods employed in designing heating plants to meet given requirements. They resolved to use their influence and funds to investigate and adopt a uniform method of figuring the heat losses of a building, and to require each one of their members to insist on installing an amount of radiation and to provide sufficient boiler capacity to comply with the existing laws and ordinances and to properly met the demand of the requirements of the owner of the buildings to be heated.

"This resulted in the adoption of the 'Certified Plan,' (based on the American Society of Heating and Ventilating Engineers Guide), making it obligatory for every member to submit a plan for every job contracted for, to be checked by the engineering department of the association. If it was found to be above the minimum standards adopted, it should be stamped and so certified, and the association would issue a guarantee to the owner that it would be responsible for the installation fulfilling the requirements of the specifications as certified.

"This assures the owner that he will get what he contracted for and is especially valuable should the contractor die or go out of business between the completion of the contract and expiration of the guarantee."

Professor Hoffman States Pertinent Truths in His Typically Kind and Helpful Manner.

Emphasizes Need for Better Construction of Homes and More Careful Installation of Furnace.

THOSE of us who have the good fortune of knowing Professor J. D. Hoffman, Dean of the Department of Practical Mechanics, Purdue University, Lafayette, Indiana, are familiar with the kindly spirit of this great teacher and clear thinker. We also know that he does not speak without knowing whereof he speaks, and the Editor is, therefore, more than pleased to be able to give to our readers the following statement from Professor Hoffman:

As I happen to find myself today in the furnace heated house of one of my good aunts, with a chicken dinner in prospect, I am in no mood to find fault with persons or things, and feel sure that whatever is herewith written will be softened with a feeling of sympathy for those whose physical surroundings may not be quite so warm and comfortable. My present feelings, however, cannot completely shut out the consciousness that there are many others throughout the country who are ready and awaiting every opportunity to condemn the warm air furnace system to the veriest perdition ever known or suspected.

Now we all know *there is a furnace problem,* but what is it? As I see it, *if we follow the rules of the game* there is no logical reason why warm air furnace heating should be condemned or seriously criticized. I am aware of the fact that many furnace plants already installed seem to be defective, but I would not charge these defects wholesale against the system.

If these are not charged against the system, then where does the fault lie?

Installer's Requirements Versus First Cost.

Principally, the fault lies with the owner. He is a near-sighted individual who is looking only at the first cost expenditure. He tries to build his house right in appearance, but as an economical structure it is too often wrong. He is careful with exposed surfaces, but extremely careless concerning hidden defects. In other words, if you can't see it why worry?

Here is the trouble in a nut shell. If he could think *less* of squeezing the competing house contractors and furnace installers down to the last

Professor J. D. Hoffman.

penny and *more* about a well built house and a foolproof heating job, he would live happier ever afterward, and we would hear less of the faulty furnace. He loses sight of the ultimate object of the system; i. e., *satisfactory heating at minimum expense.*

I have known many furnace plants in six-to-eight-room residences that burned 15 to 20 tons of good soft coal per season, that should have given satisfactory service on one-half this amount. The wastage was a continuous yearly expense and represents a penalty that should not have been required.

The *satisfactory* warm air furnace plant is housed in a good type of building and carefully installed. Such a system can easily pay for its own first cost, when compared with many that are now installed and many others now being installed, in from five to seven years' service. Is this not a good rate of interest on the extra money invested in the plant?

A few dollars well placed in better wall and attic insulation and in better workmanship, and a change from 4-inch to 6-inch stud partition walls with a corresponding increase in stack sizes, *a change which may, by the way, be made at an inappreciable expense,* would eliminate most of these complaints. These points should not be charged up against the furnace system. The owner has full control here.

Real Responsibility Rests With Installer.

There is another real responsibility, but in this case it reflects principally upon the men who install the furnace. These men are supposed to know their business, but unfortunately many of them do not. Worst of all many contracts are taken without serious thought and with the full intention of skinning the job if possible. This situation may be controlled in part by the owner, if he is careful in the selection of the man who does the work. Any person who has been known to slight a contract forfeits the confidence of the public and should not complain if his future services are ruled out in favor of his higher priced competitor.

The situation may be greatly improved in the future by the general adoption of the Code proposed by the four national societies interested in furnace heating as a working basis for all future furnace installation work. This code is not yet complete, nor is it claimed to be perfect in all its parts, but a large part has recently been agreed upon and printed in pamphlet form for distribution. As fast as additional sections are agreed to these will be added to the present code. Also, when more authentic information convinces the committee that any part should be corrected or enlarged this will be done.

Summarizing, the facts in the case are these:

(1) Furnace heating systems are probably the most adaptable of all heating systems.

(2) Furnace systems are criticized largely because of

(a) Unsatisfactory house construction;

(b) The awarding of the installing contract to the lowest bidder, irrespective of his qualifications;

(c) A lack of definite information concerning what is good furnace installation.

(3) This branch of the heating industry, more than any other branch, depends for its successful promotion upon a deepened interest in the business by the house builder and a full regard for the furnace code by the installer.

George Harms Foresees Plenty of Warm Air Furnace Work with Prospect of Higher Prices.

Continued Activity in Residence Building and Necessity for Much Replacement Presage Good Business in 1924.

COMING from George Harms, who is one of the best posted men in the warm air furnace industry on underlying conditions, the following statement will be read with interest and benefit:

Important to Furnace Installers.

From present indications, building operations in 1924 will at least equal, if not surpass, those of the present year. Consequently, there will also be *an abundance of warm air furnace work*. Much has been said and written about furnace prices, furnace codes and standardization, and if any or all of these propositions are carried into effect in 1924, it is well that the furnace installer watch his step.

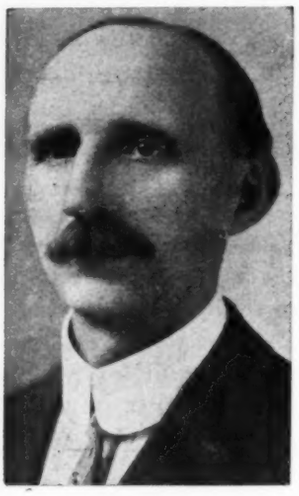
First, regarding prices; there has been a constant demand for lower prices on furnaces, but with the present price of pig iron and the continued advance in labor costs, it is very doubtful if any reduction whatever can be made.

The supply of furnaces is pretty well exhausted and if the demand is anything like it has been in the past year, it would be well to consider early purchases, as thereby you will certainly save trouble on account of delay and you will probably save some money on account of future advances.

Prices on furnace pipe and registers will experience the usual reduction which will, no doubt, be established by the time this article is read.

Neither tin plate, galvanized sheets, nor other materials have been reduced and labor is also the same as it has been in the past.

Consequently, there would be no reason of a reduction in price, but as supply and demand govern these commodities very much, and there is very little demand for pipe or registers early in the season, these reduced prices are only an incentive for early purchases, and whatever reductions may be made will be for the early part of the season only; so it will pay the shrewd buyer to consider his requirements and get under cover early in the season.



George Harms.

Considerable money can be saved if this is done.

The Furnace Code adopted by the various organizations is generally considered as a big step forward in the advancement of furnace installation.

Architects are preparing their specifications to harmonize with the code.

Many house owners are demanding that their work be done according to same, and a large number of installers are beginning to realize that in this manner they can assure their customers better satisfaction and all their work being uniform, allows them a better margin of profit.

Standardization of registers, particularly those for side-wall use, has only been considered late in the season, and neither the manufacturers of registers nor the pipe manufacturers have as yet had a chance to give it a proper try-out.

It is, however, of great importance to the manufacturer, the installer and the ultimate consumer with only a limited number of sizes, these, however, to be such that they cover all requirements.

The installer can save considerable money through carrying a reduced stock, and at the same time always have that which he needs. With a standard size for the bottom opening of the different makes of side wall registers, he will very materially reduce the number of pieces that must be carried in stock, and with all sizes standardized, mistakes in cutting wood work will not occur, thereby saving considerable wasted energy and money.

The installer can make 1924 a profitable year if the things mentioned above are given proper consideration.

When two people come shopping together, you have to reckon on both and must try to convince both. And it is a great deal more satisfactory to talk with both customers as you go along than to get one convinced and then have your sale snatched away from you by the friend interposing her veto. Determine which person is doing the buying and then invite inspection from the other person as well before she is called upon by the first person.

Former President of National Warm Air Heating & Ventilating Association Urges Better Merchandising.

Chain Store System of Furnace Selling Cannot Stand Against Quality Work and Aggressive Selling.

AMONG the men who have stood out as leaders in the movement for a clearer understanding of what warm air heating really means to the home owner the name of Irving L. Jones, Treasurer of the International Heater Company and for two years President of The National Warm Air Heating and Ventilating Association, is one to be found high in their list.

Mr. Jones emphasizes in the following statement the necessity for "Better Merchandising":

Answering your question as to what, in our opinion, is the most important point for the installer to give his attention to during the coming year, it would seem as though this could be best summarized in the slogan "Better Merchandising."

The chain store system of selling furnaces does not win on price, quality of product or workmanship, but through the application of enterprising sales methods as between the contractor and the consumer. If the local dealer would show the same amount of initiative in going out and looking for business with the advantage which he possesses as a citizen of the community, he should have no trouble in meeting that kind of competition. If he does not happen to have that kind of competition to deal with the example of such methods is still before him.

The adoption of aggressive selling methods as contrasted with the attitude of indifference shown by so

Irving L. Jones.

many dealers, one of those who "takes what comes to him," "can't meet the price," "won't pay for quality work on material and installation," will bring profitable business in increasing volumes to the furnace installer who is enterprising enough to adopt such methods.

Hill Lays Stress on Necessity for More Aggressive Selling by Furnace Installer.

Competition by So-called Direct-from-Factory Branches Is Not Serious for Installer Who Is on the Job.

IT IS only a little over two years years since W. H. Hill became President of the Fox Furnace Company, but he has already made a big place for himself in the industry because of his progressive and yet thoroughly sound ideas, coupled with his ability to put them into practice.

Mr. Hill made the following statement as a reply to our question, "What is the most important point for the installer to give his attention to during 1924?"

Our answer is, "To go out after business." This can be done by personal solicitation and by correspondence, but it has been our experience that the average installer prefers to let business come to him rather than to go out after it, and as a consequence business is being taken by furnace manufacturers who operate their own installation departments, to the detriment of the local installer.

The local man should be able to secure business in competition with the furnace manufacturer doing installation work, but business is secured by going after it, and if the local installer will make a canvass of the old homes in his town he will find opportunity not only for the installation of a furnace in a house now warmed by stoves, but will find many opportunities for replacement of old furnaces, and work among the old homes is not competitive, while the new home is a target for competition, and usually the new house is figured so close as to render a very small profit.

I believe that if you will feature this matter in the Warm Air Furnace Special, it will present to your readers the most important point for their attention during the coming year.

Simple Instrument Shows Moisture Content of Air in House.

In order to find out the moisture content of the air in your home, an instrument called a whirling psychrometer is used. It is provided with a chart which gives the amount of moisture in the air from thermometer readings directly in percentage.

The whirling psychrometer consists of two thermometers fastened in a metal head plate and attached to a suitable handle by which it is swung through the air.

A good substitute may be made by attaching two ordinary household thermometers side by side upon a piece of board or metal, to one end of which is attached a cord. The mercury bulb of one of the thermometers is incased in a linen cap, which is kept wet when in use and is known as the wet bulb; and the other thermometer is kept dry.

L. J. Mueller, Jr., Is Not in the Business of Offering Advice, So He Cites Real Cases.

Experience Shows, He Says, That Good Installation Work, Coupled with Real Selling Effort, Will Produce Profitable Results.

THERE are three things that a warm air furnace manufacturer must do in order to make a success:

First—He must make a furnace that will not only generate sufficient heat to keep the people comfortable who occupy the residence in which the furnace is installed, size, of course, to be considered; but also give many years of service.

Secondly—He must sell this furnace to concerns who can be depended upon to install it in the proper manner.

Thirdly—He must sell enough of these furnaces to yield him a fair return on his investment.

Not a hard job, you say:

The first may not be such a difficult proposition, and it is not for the man who is honest with himself and with his customers.

And yet, there are many furnaces on the market on which no real honest manufacturer would want his name to appear.

It costs more money to make a good furnace than it does to make some of the contrivances that go under the name of furnaces.

It is always easier to sell a low priced article, because there are so many people who look at little more than price—both among installers and home owners.

But in the long run, the manufacturer who nails the "quality banner" to his mast head will always win out.

As to the second—installers are coming to see the value to their business of a reputation for good work, in steadily growing numbers.

The third is really the most important point, for unless the installer is aggressive and efficient in his selling, he will not sell as many furnaces as he ought to in consideration of the conditions and opportunities before him.

And it is in this connection that the chief trouble of the furnace business is found:

In many sections it has been a case of dog eat dog and of price competition, almost to the exclusion of profit to the installer and real service to the customer, for, of course, a profitless job is certain to be "skinned."

We have found, however, in our intensified, personalized selling campaign, that as soon as the average intelligent installer has had a chance to give real serious consideration to the matter of selling a quality product on which he was reasonably certain of a fair profit, he agrees to put his shoulder to the wheel.

There are thousands of new houses being built which should be heated with warm air furnaces, but which are fitted with hot water or steam systems, at a cost far higher than would be required for the best warm air furnace installation that could be made in them!

And yet, there are furnace installers who say that high quality furnaces can not be sold on their merit!

A Better Furnace, Assuring Dependable Heat, Sold On a Better, Easier Plan
The Furnace
The Mueller Double Radiator Pipe Furnace is the best furnace investment you can make, because it gives you the utmost in heating surface, fuel economy, and quality for the cost of an ordinary furnace.
Sixty-seven years of furnace manufacture have taught us valuable lessons that only long experience can teach. Every worth while development of those years has gone into Mueller Furnaces. They assure Dependable Heat as no other furnace possibly can. And they assure it for a longer period than any other furnace can give any kind of heat.
All furnaces look alike outside. Look inside before you buy.
Prices from $150.00 up, f.o.b. Milwaukee. Pipe, registers and labor extra.
MUELLER FURNACES
— dependable heat —
L. J. MUELLER FURNACE COMPANY
180 Reed Street, Milwaukee, Wisconsin
Branches:
ST. PAUL MINNEAPOLIS PORTLAND SEATTLE SALT LAKE CITY CHICAGO NEW YORK DETROIT ST. LOUIS
The place to test the truth of these statements is in a Mueller Franchise Dealer's Store. You will find the address of one near you in the list below. Look him up—get the facts he has for you.
The Plan
See your Mueller Franchise Dealer now. After he has demonstrated the real superiority of Mueller Furnaces, ask him to explain the Mueller Easy Payment Plan to you. Learn how you can have a Mueller Furnace installed in your home at once and have a year to pay for it.
The ease with which you can buy one of these quality furnaces will surprise you.
Don't hesitate to call on your Mueller Franchise Dealer right away and ask him for complete details regarding the furnace and the Easy Payment Plan. Because he is a Mueller Franchise Dealer, he can tell you all you want to know. He represents the L. J. Mueller Furnace Company fully and will give you the same service you would receive if you dealt direct.
There are more than 450 Iowa Mueller dealers, including the Mueller FRANCHISE Dealers listed below—See the one nearest you.
Des Moines—H. P. WILLEY HEATING & PLUMBING CO., 515 Third Street, Phone Walnut 1551
Dealers: You may be in one of the remaining centers where dealers of Mueller calibre are needed. Write for our proposition.
Salesmen: Increased business necessitates increased sales force. Write for application blank and interview.

A Half-Page Advertisement Run in Des Moines, Iowa, Daily Papers in Co-operation with Installers Selling Mueller Furnaces.

It is my conviction that the boiler men are taking advantage of this tendency on the part of the typical furnace installer to see how cheap he can figure a job, instead of how well he can do his installation and let the price follow the quality.

And I can say this without fear of having it said that I have an axe to grind, because our Company makes boilers as well as furnaces.

We know from our experience that whenever an efficient installer has that "something" put into his make-up that you call "pep," he also comes to believe that a well installed furnace job is worth a price that will yield a reasonable profit—and we prove it to him, by having our own salesmen make one or more sales with him.

Right now I call to mind a man who until last Spring followed the old "cut-throat" competition method. He was satisfied if he made ten dollars net on a furnace.

He was induced to take on the Mueller line, and today he has the satisfaction of knowing that he can make fifty dollars on a job just as easily as he made ten before. Of course, he sells a better furnace and he does better work, so his selling price is naturally higher, and he does not do quite so much work for the speculative builders, but he told me recently that in the last six months he has made more real money than he ever did in his life during the same length of time.

And his case is only typical of hundreds of others who have joined the Mueller organization.

I am not inclined to offer advice, because too often the best intended advice is received with anything but open arms, but since you have asked me what the installer ought to give more attention to during 1924, I shall just put down these pointers:

1.—Select a furnace that you can afford to stand back of, preferably one the manufacturer of which is ready to help you with advertising, engineering and selling services.

2.—Resolve that you will use to the best advantage the selling helps the manufacturer supplies you.

3.—Go after business on the basis of good work and a commensurate price.

4.—Make a real canvass for prospects.

5.—Follow up these prospects—in person and by mail.

Those starting with the cheap bidding idea have a "Die Dog or Eat the Hatchet" existence; they simply cannot make the grade, for the reason that your customers either make or break you—get that in your head. You cannot work up a successful business against a lot of dissatisfied customers knocking you, but no competitor can get your trade when your customers are talking you up to their friends. Your future is exactly in keeping with the man and his merchandise. I have seen thousands of "ups and downs," and there

Harry Van Bayse.

is no exception to this rule. If you desire to pave your way for a good and profitable future, first learn to properly install a furnace, then select the best furnace on the market, then talk real warm air heating and deliver the goods accordingly, and you will without doubt become the idol of your town as the real article when it comes to heating.

Thirty-five years ago I started at this business at nine dollars per week, third grade schooling, but I had possibly an advantage in knowing where I could borrow as much as fifty cents without security.

Yes, I said, learn your business thoroughly and have guts enough to insist upon being a high class furnace man selling the best goods on the market, for the reason your future prosperity is exactly in keeping with what you, and you alone, make it.

Study every page in this issue.

Heating Is One Thing and Bidding Something Else in Furnace Business, Says Harry Van Bayse.

Man Who Depends on Low Prices Will Never Make Much of a Success as a Furnace Installer.

FURNACE men who know Harry Van Bayse personally—and there are hundreds of them—also know that he expresses himself in language that is plain and without sugar coating.

In the following article, the President of the American Furnace Company, who is this same Harry, has something to say that every furnace installer can well afford to meditate upon:

Pardon the expression, but the two things needed most by the majority of furnace dealers are:

First, to be educated up to better furnace heating.

Secondly, having "guts" enough to talk it and stand pat on real warm air heating in preference to cheap "Bidding," explaining that "Heating" is one thing and "Bidding" is another.

The writer has been constantly engaged at this business for the past thirty-five years and has visited the dealers once each year, for the past over twenty-five years, from Philadelphia to San Francisco. I have seen all kinds of dealers with their different experiences; usually start very small; a great majority of them fail; next class making very little progress; next class some better headway, and very few go right on up the grade to the top.

Jim Doherty Says That a Bit of Courtesy Toward Rushed Customers Will Cause Them to Wait.

More Careful Figuring of Requirements and Proper Selection of Furnace and Fittings Is Needed.

IN THE Chicago territory one of the best known and best liked furnace men answers to the name of "Jim," his full nomenclature being James Doherty, Vice-President of the Utica Heater Company.

The following wholesome advice as to the treatment of customers and as to figuring furnace jobs rightly, both as to price and as to capacity, comes from Mr. Doherty's pen:

There is one point that I would like to see you bring out in your editorial matter, and that is the fact that furnace dealers should extend a little more courtesy to their customers.

Especially at this time of the year, when the furnace man is busy, the impression he leaves with the consumer is that of independence. He should explain to the consumer that he is rushed and ask the consumer, or prospective customer, to hold off for a week, ten days or two weeks, when he can give him proper attention. Unless the furnace dealer does this, he will find that his prospective customer is going to the Mail Order House, which he is doing today.

Another thing that I may suggest to the furnace man is that he give thought to balancing up his pipe sizes, cold air and warm air. A great many of the installers consider nothing but the "dollar" when they give an estimate. They want to get the job and instead of talking quality and recommending to their prospective customer not to think of dollars and cents, but to think of a heating plant that will last them as long as they live, they talk price only.

E. C. Fox Puts Down Two Most Important Rules for Success by the Furnace Installer.

Basis of All Is Efficient Installation Work; Next Comes Ability to Sell, Which May Be Acquired.

ONE of the men who seldom say much in conventions of the furnace industry, but who have something really constructive to offer when they do speak, is E. C. Fox, of the Independent Register & Manufacturing Company.

In his characteristic manner, Mr. Fox makes the following statement, brief and to the point:

In our judgment, success to the furnace installer will come through salesmanship and care in making installations. The two go together.

Without successful installations no amount of salesmanship can secure continued success, but every furnace installed which operates in a satisfactory manner becomes a sales help, all through the many years of its life, for the furnace itself and the man who installs it.

If the installer will be sure his furnaces are of sufficient capacity, located in a central position, the pipes of suitable size, the registers and cold air return of proper open area, successful operation will be assured.

The valued asset of good will plus even moderate ability in salesmanship is bound to bring success, and the easy way to secure good will is through satisfied customers.

Here Is a Good Sales Argument for Higher Grades of Warm Air Furnaces.

The following is quoted from one of the many helpful booklets sent to their warm air furnace installers by the Waterman-Waterbury Company:

You Buy But One Furnace in a Lifetime; Why Not Buy a Good One?

Suppose you do buy a good furnace and pay even as much as fifty dollars more for it than for an inferior make, how can you get your fifty dollars back?

1st. You will save not less than 10 per cent in fuel each year—six tons hard coal at $18.00 equals $108.00. 10 per cent of $108.00 equals $10.80 per year saving—say for 10 years (if you properly insulate your house, you can raise this to 25 per cent)	$108.00
2nd. You will avoid streaking the walls, which means that you will have to decorate your house half as often, say once in ten years, with a good furnace—twice with a poor one—saving of one complete decoration about	100.00
3rd. A good furnace will last twice as long as a poor one, and you will therefore save in the extra life of your good furnace	100.00
Total saving in ten years	$308.00
Less extra cost of furnace	50.00
Net actual saving....	$258.00

But dollars and cents savings will not be all you will get. Greater Comfort, Better Health, Less Work, Greater Pleasure in Life will be yours all through these years.

What Is a Good Furnace?

A good furnace—

Warms your house with a spring-like warmth—all over.

Gives you a more satisfactory warmth than either hot water or steam.

Warms your house with at least 10 per cent less fuel.

Does not streak the walls.

Does not belch gas, dust nor smoke into your home.

Buck Taylor Has Some Good Advice in Regard to Price Cutting Competition.

Being on the Job Every Day Is Not Enough—You Must Keep Telling Your Story and Tell It Right.

"TO MAKE a good furnace salesman you have to mix brains with 'gab,'" says Buck Taylor, Salesmanager of the Premier Warm Air Heater Company, and "Buck" is a good salesman of furnaces, as witness his rapid rise to responsibility. So what he has to say about furnace selling by the installer will be read with interest:

Selling More in '24.

Without a doubt, Selling More in '24 will be the keynote of a good many sales organizations. For, after all, without sales there is no manufacturing, no installing, no collecting, and no profit. Consequently, the problem of sales is daily becoming of more importance. Sales are the hub from which go the various spokes that make up the wheel we call business.

Progressive salesmanagers are coming to realize more and more that the sales made by their dealers are as much of a problem as those made by their travelers. Within the past month and during the next one volumes will be written, hour after hour taken up in earnest conversation, unlimited energy consumed, and thousands of dollars spent on this all absorbing problem of sales. In the hands of the furnace dealers lies the answer as to whether this work will be of value or in vain.

No problem is as important to the furnace dealer today as that of sales. The very nature of the furnace business has been, and still is, such that this important phase of the business has been neglected. Primarily a business calling for engineering ability and mechanical skill the natural tendency has been to neglect the value of selling ability. This course has been pursued until today there are countless merchants who refuse to concede any difference in price on account of quality and conduct their business on the basis that the lowest price is foundation of successful selling. In reality, nothing could be further from the truth. The greatest success in the mercantile field today is, without a doubt, Marshall Field & Company, and their foundation was quality. Neither has cutting the selling price till there was no profit included been characteristic of that great Woolworth organization, and we point to the massive

E. C. ("Buck") Taylor.

monument known as the Woolworth Building as proof. True, in their case the price was low, but the quality was the highest obtainable for the money spent. And so it goes, throughout the field of modern business; on every side are countless examples of men who left vast fortunes built from good merchandising.

How to Combat Price Cutter.

You as a furnace dealer will naturally ask—how am I going to make money from my business if my competitor keeps on cutting prices? A perfectly natural question, and one entitled to a serious answer. In the first place, it is well to discount a good deal of the idle talk you hear about your competitor being so much lower in price than you are. Modern purchasing agents wore that out some years ago, when confronted with real salesmanship. It reminds me of a conversation that took place some time ago when a bright, alert young advertising man was in my office selling me a Direct-by-Mail Campaign for 1924. When told what another organization had offered to plan a campaign for us, he called our attention to the fact that he was selling brains and ideas along with the paper and ink that carried the message. Then in an offhand sort of manner he remarked, "Of course, if you are only going to buy printin', then they are as good a people to buy from as any I know of." Somehow or other there was a barbed hook in the way he said "printin'". You could just see a sort of run-down country print shop and you knew right then that you wanted the brains and ideas that went along with the finest craftsmanship and materials. He got the job.

Are you, then, doing the same class of work that your competitor does? Is it impossible for you to get agencies for better lines than those you are now handling? Can't you secure better workmen than he has? Are your ideas of service no better than his? If such is the case, what chance is there for you in this race that has for its motto "the survival of the fittest"? Think it over! Better make up your mind right now that when it comes to materials, labor, lines handled, and service rendered, you are going to excel. With ideals like these as a basis, you have a fair foundation to work on. The next step is telling it to the world.

Tell Your Story.

The *Chicago Tribune* has for a slogan, "The more you tell, the quicker you sell." It is true of any line of merchandise. You have to tell them in order to sell them. It does not take any college degree to sell goods. A plain, straightforward story of your wares, carrying a clean, truthful air along with it, will get you much further. But, by all means explain. Don't go out to a woman and tell her all about the

casing area of the furnace you are handling. Tell her the same story in a language that she can understand. By all means see to it that she does understand and appreciate the good points of your product before you leave. Make your story of a furnace so interesting that she can see the comforts she is going to have when she gets that furnace installed. Make her realize the advantages to her, the lightened load of labor, and so on to the end. There is nothing complicated about it; just tell her the story in a plain, clear sort of way.

Don't forget that advertising is another way of telling them. Possibly you are competent to write your own advertisements. If so, more power to you, for you can then inject your own personality. If not, let your manufacturer supply you with ads. Most of them are only too glad to do so.

Selling Furnaces Every Day.

Next take advantage of all the merchandising helps that the manufacturer has to offer. If he has nothing to offer in this line, look around; there are plenty that do. But, by all means make use of them. Reports coming in from our dealers who have made use of our merchandising service the past year indicate that it helped them sell 50 per cent of the furnaces they sold. It sold seven second-hand furnaces of another make for one dealer, yet there were plenty of customers who did not take advantage of this system. Why? I don't know; maybe they did not have the time; possibly it had not been thoroughly explained to them. We are going to make strenuous efforts to get them to use it the coming year, for it will increase our sales and we are vitally interested in that end of it.

Finally, keep everlastingly after them. The factory branch competition that some men dread so much is nothing more than the efforts of a man who sells furnaces all day long 365 days in the year.

Price-cutting is a low down way of selling goods, if it may be called selling at all.

Miles Discusses Forced Air Heating From the Standpoint of a Man Who Knows.

Sees Great Opportunity for Progressive Furnace Installer Because of Wider Field.

WHAT J. C. Miles has to say about Forced Air Heat comes from a man who has been in the warm air furnace business for many years and who was one of the pioneers in the matter of using fans to push warm air to rooms which could not be reached with the gravity system.

Mr. Miles is President of the Miles Furnace Fan Company, Cleveland. His article follows:

"Forced Air Heating" is the most important phase of Warm Air Heating for the coming year.

In view of the fact that this issue of AMERICAN ARTISAN AND HARDWARE RECORD is known as the Warm Air Furnace Number, the question of the most important phase of the Warm Air Furnace Business will, in all probabilities, predominate, and in allowing me the privilege of contributing an article on this subject, the Editor pays a compliment which I wish to acknowledge.

"The most important point for the Furnace man to give his attention to the coming year?" To my mind a positive system of Warm Air Heating is that point.

The question of Air Conditioning is now uppermost in the minds of the thinking American people, doctors, hygienists, medical journals, life extension bureaus and current periodicals are discussing at length this question, Air Motion being regarded as the most neglected phase of home conditioning.

Dr. Eugene Lyman Fisk, Medical Director of the Life Extension Institute, is quoted in the September *American Magazine:* "We grow old because of food deficiencies on one hand or food excess on the other." . . . "Air deficiencies and defects relate chiefly to extreme temperatures. Excess of humidity and lack of motion in the air around us. The popular notion is that lack of oxygen is the gravest air hazard that we are subject to; but there is never lack of oxygen in a wide range of human living conditions. A man can breathe comfortably in an atmosphere where a cigarette would go out. Provided the air is cool, of a proper humidity and kept circulating, there is no known injury from carbon dioxide or lack of oxygen.

"It is important to keep in mind that the problem of air relates quite as much to the skin as to the lungs. Overhot and overhumid air, especially *stagnant air,* does not allow proper radiation of heat from the body which accumulates a surplus.

"It is well to lift this bogy of lack of oxygen and remember these fundamentals of air hygiene."

Another eminent hygienist says: "To buy an automobile is sophistry if our home is not ventilated," and by ventilation he means fresh air; not altogether outdoor air, but that which is freshened by motion. Dr. Woods Hutchinson in a *Saturday Evening Post* article writes, "Not in one case of ten are disease germs transmitted by direct contact but rather lurk in the corners of the rooms where they, undisturbed, multiply until hazardous."

Hence we have invaluable influence and potent propaganda for the Warm Air System for homes, because of its very nature. The warm air furnace is an air circulating system. But let us not deceive ourselves. We cannot avail ourselves of this influence or free advertising unless we are in a position to produce the results in their entirety. That is to say: It is asinine for us to approach a prospect who is interested in the hygienic condition of his home with a suggestion that is obviously no different from thousands of other systems now in use, which have little more than an attempt for claim to recognition.

These eminent men of hygiene tell us, *we need proper temperature,* humidity and air motion, and we must first work out the details of these essential requisites as to how they are to be applied and present them one by one to the prospective buyer.

I hear a roar of, "O Yes! that requires 'salesmanship'."

Certainly it requires salesmanship, but in view of the much free advertising we are getting, could you imagine a more advantageous position, and besides where is there a man who has had any degree of success, who was not a salesman in one way or another?

"Competition is the life of trade," providing it is in merit and not in price. The automobile business is a shining example of this. When there is competition in merit there must be sufficient profit to justify the pursuit of a better product, and the profit is the inseparable partner of successful service to the public; but in order to receive this much coveted profit, and serve the public, as it is our duty to do, we must show what the merits are, and how our object is attained.

This means merely that the public shall see the logic in our theory and be convinced that we will accomplish the end in view.

To say that furnace men are not salesmen, may be true, generally speaking, but to say that furnace men may not becomes salesmen is to insult their intelligence.

Salesmanship is in having an idea, in which you firmly believe, conveyed to another party, and if this idea has merit, and the merit is recognized, the dotted line performance requires little engineering skill.

It is well to bear in mind that salesmanship is the science of making others see as we see (this is really easier than we sometimes think, because he sees inconsistencies which are also obvious to us).

To get the name on the dotted line where inconsistencies maintain, is not salesmanship, but sophistry, and he who practices these tactics is not a salesman but a sophist. Hence 75% of salesmanship is in having the goods, the other 25% is in believing in them yourself, and the courage to present them to your prospect.

The Warm Air Furnace man of today has before him a vast field of opportunity, and he is indeed remiss who will not grasp the opportunity, capitalize his advantage and get in on the ground floor of this wave of public sentiment and scientific propaganda for air conditioning in the home.

We are our own worst enemies, in that we have not ere this adopted the policy of a higher class work. The hot water system is clear out of the running, and the indirect steam system takes a roundabout way to accomplish that which is of the very nature of the warm air furnace, besides the indirect steam system price is prohibitive.

If we were to take a plan of a house and calculate the heat loss, the required humidity and air volume, and design a warm air system of sufficient heating capacity, air volume, and moisture content; the heating capacity ample and automatically controlled the air volume positive, the dust sizes scientific as to velocity, shape and position, the humidity properly regulated at all times—all such that we might say to the owner, "These features we offer as a complete system and each and every one of them is guaranteed under a surety bond to perform as specified," that owner would immediately regard us as business men worthy of consideration, and in considering he would learn that our system incorporated all of the essentials of health and comfort in a home, and at a price consistent with good business principles, but less than any ordinary steam or hot water system of heating.

I believe that thousands of our furnace men throughout the United States and Canada will agree with me, when I say this procedure requires not salesmanship but sincerity of purpose and courage to do.

The hitherto formidable obstacle to these potentialities has been the inability to safely guarantee the air volume, at all times and under all circumstances, as air volume is the medium through which all else is accomplished.

We must, therefore, look to a means of positive air supply. This means is a fan mechanically propelled, simple in construction, positive and economical in operation and easy to install. It must also be so designed that it may be shut off without interfering with the gravity circulation of the system. This may or may not be automatic.

The reason for the alternating principles (mechanical or gravity) is that, under favorable conditions the effect of heat creates a circulation, but where and when a condition of resistance exists, mechanical force is all that will overcome the resistance, but as soon as the resistance is overcome, the ducts heated up and circulation established mechanical force is unnecessary, nor is the increased heating capacity, due to the fan, necessary after the house is once warm.

I would liken the principles of Forced Air Heating to Jack Dempsey's legs.

The "Bull of the Pampas" was a big powerful opponent for Dempsey, who trained well but in general Dempsey paid strict attention to his legs; he built up a strength in his legs which was far in excess of normal pugilistic requirements. Fifty-nine seconds out of each 60 seconds he did not need this strength, but when he went down, his legs did not crumble under him as did Firpo's, and when the blow was not sufficient to literally lift him off his feet, his legs supported him and he won the fight.

So it is with Forced Air Heating. It is there when you need it to win the fight against the elements, disease and discomforts.

The more you use your brains to save time and trouble and increase sales for the store, the more valuable you will be considered by the management. Employers are constantly on the lookout for men with initiative and "pep." Just another way of saying there is always room at the top.

Know Your Furnace, Believe in It Fully, and It Is an Easy Matter to Sell it, Says Monfort.

His Suggestions Are Pointed and Will Be Helpful to Any Installer Who Does Not Know It All.

R. B. MONFORT, Secretary of the Farquhar Furnace Company, is known as a "cracker jack" salesman, and in the following article he gives a synopsis of what is required to build a successful furnace installing business:

The Man Between.

There are many things which a Heating Contractor or Installer must constantly keep in mind because they have a bearing upon his progress; consequently, if I had to confine myself to a single statement for his benefit, it would be, "Continue to be a Student."

Looking at the subject from another angle: if he wishes to enjoy a full measure of recognition in his community, and to establish a prosperous and permanent business, he must render a high degree of service through the equipment which he sells, for this eventually means permanent success.

The possible ramifications on the subject of heating are so great; so much theory and technicality could be injected that might not prove helpful, that it seems advisable to touch only on a few practical topics for study.

Selection of the Proper Heating Equipment.

Be sure that the heater is scientifically designed to insure the highest degree of efficiency and is actually gas tight in its construction.

These features deserve most careful study and analytical thought, for no matter how carefully the Heating Contractor may figure the job or how perfectly he makes the installation, if he fails in making the proper selection of furnace his efforts will be largely lost. He should not permit the manufacturer to prove a handicap in reaching that goal which is his life's ambition.

Capacities.

Without careful attention to this subject the Installer again runs a great risk of jeopardizing his future. The size of the heater and the pipes should be such as to maintain comfortable temperatures in zero weather without necessitating the devitalization of the air by overheating. From a hygienic standpoint it is important to deliver a large volume of moderately heated air instead of a small quantity of burned air that has been rendered unfit for breathing purposes. Ample capacities will add to the longevity of the equipment and lower operating expense.

Automatic Regulation.

This is vital from the standpoint of economy and very important in maintaining uniform and stimulating temperatures. It probably will mean more in insuring a minimum of fuel consumption than any other feature about the heater. And just think of firing only "once a day" in ordinary winter weather. Get an outfit that is free from delicate mechanism which may prove a menace instead of a protection, one that is simple in construction and positive in results. A proper selection will relieve the home owner of the anxieties and uncertainties due to runaway fires and their resultant losses. It can prove an attendant even more reliable than human vigilance.

Ventilation.

Here a high degree of engineering ability is required. The layout should be made so as to insure positive distribution of heat to all rooms; to prevent great difference in temperature between floor and ceiling; to eliminate annoying drafts upon the floor; to avoid stagnation and to promptly remove the personal contamination from the atmosphere.

The importance of maintaining the purity of the atmosphere is obvious, and one should exercise great care in eliminating fire poisons and providing a frequent change of air in each room. If it is possible during the winter months to enjoy an atmosphere in the home that is pure and invigorating, that is as stimulating and energizing as you would experieince in the vast open, is it worthy of consideration, especially if it means much to one's general health? The essentials for adequate ventilation can hardly be touched upon in a short article, but they must be acquired to render the greatest service to humanity.

Positiveness.

Naturally it is important to show a prospect every possible consideration and courtesy, and one must always realize that he has the final decision as to the purchase of equipment. This does not mean, however, that the Heating Contractor should be wrongly influenced as to the proper installation. He should not let the prospect tell him what to do in this respect, but he should assume a positive attitude and tell the prospect what is necessary for satisfactory results and stick to it, for their mutual benefit.

Promptness.

Delay in calling upon the prospect creates an element of doubt in his mind and is to the detriment of the product and the Heating Contractor; failure to make installation at the proper time increases the owner's distrust and postponed promises add to the general dissatisfaction, so promptness is a requisite of service which leads to success.

Selling.

Salesmanship is simply teaching the prospect what one knows of the benefits to be gained by the use of certain heating equipment. Tell the story pleasingly and convincingly, but do not exaggerate or leave an opportunity for any misunderstandings. The more knowledge the Installer has the more clearly he can paint a mental picture that will create a desire for what he has to sell. He should not expect the prospect to learn in one-half hour what it took him a year and a half to acquire, therefore he must exercise patience.

Look out for the flue to which furnace is attached. A poor one will

draw a year's profits—but little smoke. It is true that the chimney is not a part of the heating contract, but the Heating Contractor gets cussed and discussed more than anyone, because of an improperly constructed flue; consequently, it really is his business to sufficiently educate the house owner to know where to place the responsibility, or better, how to build a suitable chimney.

You may ask how can one do all these things; where shall one obtain the necessary information?

Just remember that medical treatment that is good for one person might be harmful to another; that a quality of oil that is adaptable to one machine may prove entirely the wrong lubricant for another machine.

As long as heating equipment differs in fundamental principles, as well as in degrees of efficiency; as long as furnaces are differently designed, differently constructed with different points of merit, it is not logical that any one rule as to ratings and methods of installation would apply to all, although that is the tendency today.

The manufacturer should be able to advise accurately just what methods are essential so his equipment may give maximum results, and that is the only sort of service with which anyone should be satisfied. Put it up to him; if he has the right sort of a heating system he should know best why he advocates its use and what its capabilities are.

There is no doubt that from the standpoint of economy and hygiene —two vital things these days—the warm air heating system will prove much more satisfactory than hot water, steam or vapor. Greater economy and better ventilation are insured. Yes—happier, healthier homes will result.

What the Heating Contractors or Installers should do is to strive for an uplift of the entire warm air industry; elevate the business to a profession that requires expert knowledge; command a price that places them out of the strictly competition class; get together and receive a fair profit for their labor and knowledge. Then there would be no doubt that they will come into their own, and have a business that is recognized as being one of the most important to the general welfare of their community. And always remember that if the right sort of heating equipment is properly installed there is no other one thing in the home that has as great a bearing upon the comfort and health of every person who lives in the house.

The manufacturer must not forget that he is under a deep obligation to the Heating Contractor, that he should assist him in business methods, supply gratis engineering service and always endeavor to be helpful. Study and progress will lead to the greatest achievement.

May the Heating Contractor, "The Man Between" the manufacturer and consumer, prosper in 1924.

A. B. Meston Predicts and Prepares for a Real Busy and Prosperous Year in 1924.

Iowa Furnace Jobber Looks for Continued Building and Many Furnace Replacements.

A. B. MESTON, Vice-president of the Quick Furnace & Supply Company, Des Moines, Iowa, predicts a most prosperous year for furnace dealers throughout the West.

"There is certain to be more building during the year to come," continues Mr. Meston, "there is more ready money in evidence and conditions generally are mighty fine. The farmer has had a splendid corn crop this year and has received a good price for it. This is going to react directly to the favor of the furnace dealer. Men who have waited for two or three years to put up a new house or to install a new furnace are now ready to go ahead.

"In our own business, we have enjoyed a most gratifying volume this year. The business of 1923 proved that our judgment was right when we made extensive plans for expansion early in the year. Because we have confidence in the healthy conditions on all sides and the good feeling through this section of the country, we are again expanding to take care of a much greater volume of business in 1924. We have taken on new lines, are increasing our warehouse facilities and regular stocks of merchandise and are putting more salesmen into the territory to take better care of the trade. We are planning for a very great increase in our volume during 1924 because we are certain that it will be one of the most prosperous years the middle west has seen for some time."

He Got a Free Course in Correspondence.

He was running a small hardware store in a newly developed district, and the wholesalers found him backward in the payment of his accounts. They sent him letter after letter, all of them polite, but each more threatening than the last. Finally they sent their representative down to give him a sporting chance.

"Now," said the caller, "we must have a settlement. Why haven't you sent us anything? Are things going badly?

"No, everything is going fine. My bankers will guarantee me all right."

"Then why haven't you paid up?"

"Well, you see, those threatening letters of yours were so well gotten up that I have been copying them and sending them out to some customers of mine who won't pay up, and I have collected nearly all outstanding debts. I was only holding back because I felt sure there must be a final letter, and I wanted to get my series complete."

The only coinage that can't be counterfeited is the sincere expression of a sound idea.

Complete Standard Code Regulating the Installation of Warm Air Furnaces in Residences.

Approved by Chief Organizations of Manufacturers and Installers, This Code Is a Guide for Residence Installations.

AT THE request of many manufacturers and installers of warm air furnaces we publish again the complete text of the "Standard Code Regulating the Installation of Warm Air Furnaces in Residences."

Those who made the request did so because, as they said, AMERICAN ARTISAN Warm Air Furnace Specials, issued as they are at the close of each year, have come to be regarded as reference books for the coming year, so that the 1923 Warm Air Furnace Special should, they say, contain the complete text of the most important piece of information and instruction that has been produced.

The Standard Code was prepared by a committee consisting of men with theoretical as well as practical experience in manufacturing and installing warm air furnaces. Their conclusions were arrived at after thorough discussion and investigation. Their recommendations were presented to the members of the National Warm Air Heating and Ventilating Association, the Western Warm Air Furnace & Supply Association and the National Association of Sheet Metal Contractors, the three chief bodies of manufacturers and installers, and were adopted as follows:

Outline.

Article 1.—Meaning of Terms.
Article 2.—Provisions in Building.
Section 1.—Construction.
Section 2.—Chimneys.
Article 3.—Formulae.
Article 4.—Installation.
Section 1.—Location of Furnaces.
Section 2.—Foundation.
Section 3.—Setting Furnace.
Section 4.—Casings.
(a) Portable.
(b) Brick Set.
Section 5.—Basement Pipes.
Section 6.—Wall Stacks.
(a) Single.
(b) Double.
Section 7.—Registers.
Section 8.—Air Supply.
Section 9.—Smoke Pipe.
Section 10.—Pipeless.

Article No. 1.—Meaning of the Term, "Warm Air Furnace Heating Plant."

Warm air furnace heating plants, to which this code refers, shall consist of one or more warm air furnaces, enclosed within casings, together with necessary appurtenances thereto, consisting of warm air pipes and fittings, cold air or recirculating pipes, boxes and fittings, smoke pipes and fittings, registers, borders and face plates, the same being intended for heating buildings in which they may be installed.

Article No. 2.—Provisions to Be Made in Building Under Construction for Reception of Warm Air Furnace Heating Plants.

Section 1. (a) The following provisions shall be made by the owner or building contractor, in any building wherein a warm air heating plant is to be installed:

(b) Where warm air register boxes, heads, pipes or stacks are to be installed, joists shall be set not less than sixteen inches (16 in.) on centers and shall be butted and not lapped. Studding shall set directly over and under joists, leaving a space of not less than fourteen inches (14 in.) between studs and joists. Wherever joists are cut, headers must be put in to support joists.

(c) All first story single or subfloors shall be continuous. In all houses having studded exterior walls, these floors shall be extended to the outside sheathing and all spaces between studding shall be closed at the attic line.

Note 1. *It is strongly recommended that the attic be tightly floored to reduce heat losses.*

(d) All partition walls (or sections of these walls) in which heat stacks to second floor rooms are to be installed shall be built of six-inch (6-in.) studding to second story floor joists.

Section 2. (a) The owner shall provide a chimney for the furnace constructed in a manner to comply with the following specifications:

(b) The chimney must be absolutely smoke-tight throughout its entire length, and must extend at least three feet (3 ft.) above a flat roof or two feet above the ridges of peak roofs.

(c) If built of a single thickness of brick or of cement blocks, it shall be lined throughout its entire length with fire clay flue lining, having not less than three-fourths inch (¾-in.) thickness. Flue lining to be laid in mortar and made air-tight.

(d) The furnace flue must have no other opening for attaching any fireplace, furnace, stove, range, water heater, gas or ventilating connection.

(e) If necessary to offset the flue, it must be done in such a manner as not to reduce the cross sectional area nor create a ledge or obstruction, where loose material may lodge.

(f) Its narrowest dimension shall not be less than eight (8-in.) inches and no flue smaller than 8x8-in. rectangular or eight (8-in.) inch diameter round will be considered suitable when hard coal is to be burned, or 8x12-in. rectangular or ten (10-in.) inch round for soft coal or wood.

Note 2. It is recommended that the height above the furnace grate be not less than twenty-six (26-ft.) feet.

Note 3. It is strongly recommended that all new chimneys be built in strict accordance with the

ordinance recommended by the National Board of Fire Underwriters.

Article No. 3.—Method for Determining Size of Warm Air Pipes, Wall Stacks and Furnaces for Use in a Residence.

Method of Determining Size of Basement Warm Air Pipes.

(Read Explanatory Notes 4 to 11.)

Section 1. First Floor Rooms.

Divide square feet of glass by 12,

Divide square feet of net wall by 40,

Divide cubic contents by 800,

Add together the above and multiply by 8.

The result is the area of the basement pipe.

The sum of:
Glass (sq. ft.) (*Note* 4) ÷ 12
Net Wall (sq. ft.) (*Note* 5) ÷ 40
Cubic Contents ÷ 800
} × 8 = Area of Basement Pipe (*Note* 10)

Section 2. Second Floor Rooms.

Divide square feet of glass by 12,

Divide square feet of net wall by 40,

Divide cubic contents by 800,

Add together the above and multiply by 6.

The result is the area of the basement pipe.

The sum of:
Glass (sq. ft.) (*Note* 4) ÷ 12
Net Wall (sq. ft.) (*Note* 5) ÷ 40
Cubic Contents ÷ 800
} × 6 = Area of Basement Pipe (*Note* 10)

Section 3. Third Floor Rooms.

Divide square feet of glass by 12,

Divide square feet of net wall by 40,

Divide cubic contents by 800,

Add together the above and multiply by 5.

The result is the area of the basement pipe.

The sum of:
Glass (sq. ft.) (*Note* 4) ÷ 12
Net Wall (sq. ft.) (*Note* 5) ÷ 40
Cubic Contents ÷ 800
} × 5 = Area of Basement Pipe (*Note* 10)

Method of Determining Size of Wall Stacks.

Section 4. First Floor Rooms.

Same as Section 1.

Section 5. Second Floor Rooms.

Deduct 40 per cent from basement pipe area determined in Section 2.

Section 6. Third Floor Rooms.

Deduct 40 per cent from basement pipe area determined in Section 3.

Explanatory Notes.

Note 4. *In obtaining glass surface use full casement opening. An outside door is figured as glass.*

Note 5. *To obtain net outside wall multiply heighth by width and deduct the glass in all windows and outside doors.*

Note 6. *For rooms having unusual exposure, ordinarily north, northeast and northwest, add* 15 *per cent to pipe area. For east and west exposure add* 10 *per cent.*

Note 7. *For cold ceilings, add one-half net area of ceiling to net exposed wall (cold ceilings are those next to unfloored attics.)*

Note 8. *Use no warm air pipe less than* 8 *inches in diameter.*

Note 9. *It is understood in using the above values for determining basement warm air pipe areas, that these pipes should be run comparatively straight and that they should not be over* 10 *to* 12 *feet in length. Sharp turns and long pipes should have extra capacity.*

Note 10. *These formulae are for* 70 *degrees inside temperature with zero temperature outside. For a temperature of* 10 *degrees below zero, add* 10 *per cent to the capacity of each pipe.*

Note 11. *The value of* 800 (*used in cubic contents*) *is for an estimated air change of one room volume per hour. If it is desired to provide for* 1½*-room volume use the figure* 600. *If for* 2*-room volume use the figure* 400. *The factor of* 8 *in Section* 1 *will give a register temperature of approximately* 190 *degrees in zero weather. Should a lower register temperature be desired, the factor* 9 *will give* 175 *degrees at the register.*

Transition Fittings and Stacks.

Section 7. Transition from warm air pipes to stacks shall be made with a well designed elbow or boot and no stack shall be less than 60 per cent of the warm air pipe area.

Method of Determining Size of Register.

Section 8. All registers shall have a free area at least equal to the calculated area of the basement pipe, transition fitting or stack to which it is connected.

Method of Determining Size of Furnace.

Section 9. Add together the actual warm air pipe areas in square inches as obtained in Sections 1, 2 and 3, and select a furnace having a free area not less than the sum of all the warm air pipe areas.

Article No. 4—Installation—Location of Furnace.

Section 1. The location of the furnace shall equalize the length of warm air runs as far as possible, yet give necessary preference to pipes supplying living rooms, dining rooms and main halls.

Foundation.

Section 2. Furnace foundation of brick, cement or other incombustible material must be provided. Said foundation to extend at least fifteen (15 in.) inches at rear and sides of furnace casing and at least thirty-six (36 in.) inches in front of furnace casing. Foundation to be level.

Setting or Assembling of Furnace.

Section 3. (a) The base ring of the furnace shall be cemented to the foundation, making an air-tight joint. The furnace parts shall be assembled plumb and level, and in a workmanlike manner.

(b) All sections and joints shall be properly fitted. Joints requiring cement shall be well filled and all bolts shall be drawn up tightly.

Casings.

Section 4. (a) Warm air furnaces shall be enclosed in metal casings or walls of brick, tile or concrete.

(b) Portable. Sheet metal casings, including casing tops, shall be

made of galvanized sheets, not lighter than 26 U. S. standard gauge. They shall fit the castings and casing rings closely, so as to be dust tight, and shall be securely fastened to the front. The casing shall be lined from the upper casing ring down to a line on a level with the grate.

(c) When side collars are used the casing top must be of sufficient height so that the largest warm air pipe can be taken from side without ovaling. In no case shall a distance less than eight (8 in.) inches be maintained between the top of any furnace and the top of casing or bonnet.

(d) Any furnace, the casing top of which shall come within sixteen (16 in.) inches of a combustible floor, ceiling or joist, shall be protected by a metal shield, extending not less than eighteen (18 in.) inches beyond the casing of said furnace. This shield shall be suspended at least two inches below woodwork, allowing free air space between shield and woodwork. No furnace casing or top, coming nearer than six (6 in.) inches of ceiling or joists, shall be allowed in any case.

(e) Openings for side casing collars shall be cut into the casing top, so that the tops of all openings are on a level. Casing collars shall be fitted into place with a proper flange, or bead on the outside and drawn up on the inside, making a dust-tight joint. All collars shall be of same size as the warm air pipes to which they are to be connected.

(f) Brick set, cement or hollow tile casings shall be constructed as follows: Walls shall be not less than eight (8 in.) inches in thickness, and shall be constructed air tight. Rectangular casing shall be, with least inside dimensions, the same as that of the portable casing of a corresponding size of furnace. Walls shall be carried to the same height as the portable walls, allowing not less than eight (8 in.) inches between the top of the furnace and the bottom of the top cover. After placing the collars for the warm air pipes, continue the masonry up even with the top of the collars, lay spacing rods of bar iron on edge or angle irons across the furnace top, cover these with sheet iron, cover the sheet iron with masonry and run up the side walls four (4 in.) inches above the masonry bed. A galvanized iron casing bonnet may be used on brick set furnaces.

Provision shall be made in the walls for a manhole to give ingress to heater.

Warm Air Pipes in Basement.

Section 5. (a) All warm air pipes shall be made of bright tin not lighter than IC, or galvanized iron. Side seams shall be locked seams. All joints shall be either double seamed or lapped not less than one and one-quarter (1¼ in.) inches, and such joints shall be beaded and soldered or riveted. All pipes shall be properly secured to ceiling or joist. No solder or riveted joint is required where round pipe slips over the casing collar. Any pipe twelve (12 in.) inches or greater in diameter shall not be made of material lighter than IX tin or No. 26 United States standard gauge galvanized iron.

Note 12. *It is recommended that all warm air pipes in the basement shall have an upward pitch of not less than one* (1 *in.*) *inch per running foot.*

(b) No warm air pipe shall run within one (1 in.) inch of any woodwork unless such woodwork is covered with asbestos paper and the paper covered with tin or iron.

(c) All warm air pipes in the basement shall be provided with dampers not more than two feet from the casing.

(d) Where warm air pipes pass through a masonry wall, a metal thimble shall be provided, having a diameter at least 1 inch greater than the pipe, and pipe supported in such a manner that the air space is uniform on all sides.

Wall Stacks.

Section 6. (a) Single Stacks. All single wall stacks or wall pipes, heads, boots, ells, tees, angles and other connections shall be made of bright tin or galvanized iron and shall be covered with not less than one thickness of 12 pounds per one hundred (100) square feet of asbestos paper. All studding and other woodwork facing said pipe shall be lined with metal and metal lath used in place of wood lath. An air space of not less than three-eighths (⅜ in.) of an inch shall be allowed on the two sides nearest the vertical studs. All pipes shall be braced in a proper manner so as not to obstruct the flow of air, but to retain the full capacity throughout. All joints shall be locked and held in place by means of lugs, or straps. No joint shall depend wholly upon solder to make it tight.

(b) Double Stacks. All double wall stacks or wall pipes, heads, boots, ells, tees, angles and other connections shall be made of bright tin not lighter than IC, or galvanized iron, and shall be made double, from and including the boot or foot piece in basement to the top of each and every stack and register head on all floors. There shall be continuous uniform air space of not less than five-sixteenths (5/16 in.) of an inch, which must be maintained between the outer and inner walls of all such pipes and fittings of all kinds, styles and descriptions; such pipes, heads, boots and other fittings to be of the styles, or equal to those accepted by the National Board of Fire Underwriters.

All pipes and fittings, either single or double, must be secured firmly in place by lugs or straps attached to the outer walls of stacks and fittings, and no nails shall be driven through the stacks or fittings at any point. No wall pipes or fittings shall be used which depend wholly on soldered joints. The various members shall be so made that all joints are locked and soldered and the several members shall be attached to each other with slip joints, which are, for the purpose intended, air tight.

Registers.

Section 7. (a) When baseboard or wall registers are used, they shall be properly and permanently attached to the stack head in such a manner that will prevent any leakage of air between the head and the register.

(b) Floor registers shall be provided either with register borders or double register boxes of tin, or galvanized iron with an air space of not less than five-sixteenths (5/16 in.) of an inch between inner and outer boxes.

(c) Registers for warm air and warm air pipes shall not be located in outside walls. The warm air registers in the various rooms shall be located in or near the inside walls in all cases.

Air Supply of Furnace.

Section 8. (a) The air supply to furnace for warm air heating plants may be taken from outside or from within the building, or may be taken partially from outside and partially from within. In no case, however, shall air be supplied to any furnace from any basement or furnace room.

(b) The cold air intake or return, where air is taken from within the building, shall have a net area throughout its entire length of not less than the combined net area of all warm air pipes leading from the furnace. This may be maintained in one or more ducts.

(c) When the cold air supply is taken wholly from the outside of the building the supply duct at its most contracted area must equal or exceed eighty (80 per cent) per cent of the combined area of all warm air pipes leading from the furnace.

(d) Cold air ducts shall be constructed of metal, tile or other incombustible material having smooth inner surface and shall maintain a constant net area throughout their entire length, and shall be made air tight. Where a boot or shoe is connected to the casing at the base, the opening shall not extend higher than a line on the level of the grate of the furnace. The width of the shoe shall be of proper measurement to make the area at least equal to that of the round or square pipe to which it is connected.

(e) Wherever the space between joists is used to convey cold air overhead, the joists and all wooden surfaces between such joists shall be lined with metal and a sheet metal pan constructed to extend not less than six (6 in.) inches below said joists. The connection from this pan to the boot or shoe shall be made of galvanized iron not lighter than No. 26 United States standard gauge, and shall have a transition collar, the top area of which shall be at least 10 per cent greater than the area of the connecting pipe.

(d) The cold air face or faces shall be made of wood or metal. When set in floors the top of same shall be flush with floor. Where cold air face is placed in a seat or side wall (whether furnished by owner, general contractor or furnace contractor), the open work of face must extend to within at least one (1 in.) inch of the floor line.

The free area of cold air faces shall be at least 10 per cent in excess of the area of the duct or ducts to which they are connected.

Note 13. *The effective area of a vertical cold air face lies within twelve* (12 *in.*) *inches of the floor line, hence the capacity of any vertical cold air face shall be determined by multiplying the base line in inches by not to exceed twelve* (12 *in.*) *inches in height and deducting for the grills or cross bars.*

Smoke Pipes.

Section 9. (a) The smoke pipe shall be as short and direct as consistent with the location of the furnace. It shall be made of either black or galvanized iron not lighter than No. 24 United States standard gauge, and of the full size of the collar on the furnace throughout its entire length. It must have no other opening for attaching any fireplace, stove, range, water heater, gas or ventilating connection. It shall be lock seamed or riveted; all joints shall lap not less than one and one-half (1½ in.) inches, and it shall be rigidly secured. Cast iron smoke pipe may be used.

(b) Where the smoke enters the flue, a thimble shall be cemented into the flue and the connections thereto made air tight. Should any smoke pipe come within sixteen (16 in.) inches of any combustible material, such combustible material must be covered with asbestos paper and a metal shield so fastened that a 2-inch air space exists between this shield and the combustible material. The shield shall be no less in size than twice the diameter of the smoke pipe and of sufficient length to cover the wood at all points.

(c) No smoke pipe shall project through any external wall or window.

Pipeless or One Pipe Furnace.

Section 10. (a) When but one duplex grating is used for both warm air and cold air in a so-called pipeless furnace, the area of the cold air intake shall be at least equal to the area of the warm air outlet of the grating. Article 4, Section 4, relative to casing, shall not govern when this type of furnace is installed, but the following specification shall be followed: The inner and outer casing of this type of furnace may be made of either black or galvanized iron not lighter than No. 26 United States standard gauge. A uniform air space shall be maintained at all points between the inner and outer casing. In no case shall the top of the furnace be allowed closer than twelve (12 in.) inches to any ceiling or joists above the furnace.

(b) Where joists are cut to accommodate this furnace, headers shall be put and braced so as not to weaken the structure of the floor above the furnace.

(c) Article No. 3, for determining area of warm air pipe, shall not govern in figuring a pipeless furnace.

(d) Where one warm air register face is used and separate face or faces for cold air supply are used, then Article No. 4, Sections 5 and 8, shall apply.

(The foregoing is the Standard Code regulating the installation of warm air furnaces in residences.)

Good will springs from a habit of mind—from a continued policy of dealing frankly and honestly with the public served—replacing in the public mind any suspicion about the secrecy and mystery of the public utility business by frank open statements of its affairs published over the company's signature periodically in the public press.

Stewart Cites Facts and Figures That Prove Warm Air Furnace Most Flexible System.

Furnaces, Properly Installed, Will Always Respond Quicker to Temperature Demands and Furnish More Uniform Heat.

PROFESSOR E. A. STEWART, Division of Agricultural Engineering, University of Minnesota, has devoted much time to the study of the various forms of heating for residences, and in the following paper, which was read before a meeting of the National Warm Air Heating and Ventilating Association, cites some of the many reasons why a warm air furnace heating plant, properly installed, gives the most satisfactory heat, both so far as temperature and humidity are concerned.

The principal portions of Professor Stewart's paper, which was profusely illustrated by slides, follows:

Merits of Warm Air Heating When Properly Installed.

The topic upon which I am to speak, sounds as though I might attempt to convince you of the desirability of warm air heating. It is obvious, however, that this is not necessary as you are already an advocate of this type of heating. My purpose then, in giving this address is to give you, perhaps, some new arguments for warm air heating; to call out some ante-diluvian arguments and at the same time point out the experimental basis for my arguments. In addition, you will note that my topic is qualified by the clause, "When Properly Installed." I attached this qualification because the type of installation controls largely the desirable features of warm air heating. Do not assume, however, that we know all about how to install the heating plant properly, but in so far as we know only.

I wish to point out some of the disadvantages of poor furnaces, and of poor installation before I take up the merits of warm air heating, as the disadvantages when present are so basic that they over-shadow the advantages. The two most outstanding disadvantages and the two things which have kept warm air heat out of tens of thousands of homes are: Dust and gas coming up with the heated air, and the inability to heat some rooms in the house. The first is by far the worst offender. Thousands of homes that have been built in Minnesota and the northwest in the last ten years would today have warm air heat instead of hot water heat, if it were not for the dirt and dust that was carried through the warm air ducts in the poor, cheap type of furnaces installed fifteen and twenty years ago. Warm air heating has had a revival there in the last four years, but it is due for another setback, because of cheap tin drum furnaces that have been installed. This issue is a paramount one. The National Warm Air Heating and Ventilation Association should solve it. You must build furnaces that will not leak gas and dust, not just for one year, or five years, but for fifteen or twenty years. You must even go farther, it isn't enough just for you not to manufacture the poor cheap type of furnace, but you must keep the other fellow from doing so. I am not here to suggest how to stop him, but maybe buy him out, stop his sales by advertising, enlist the help of educational institutions, and maybe use the politician's method, legislate him out. It is a live problem. The cheap furnace that leaks gas and dirt in one or two years is a curse. It is a menace to the man that manufactures it, to the man that installs it, to every manufacturer or installer of warm air furnaces and to thousands of home owners, who might be better off financially, and might enjoy more health, happiness and comfort if they had a properly built heating plant.

Installers Must Be Instructed More Efficiently.

The second disadvantage, namely, the inability to heat some rooms, is not fundamental nor as serious, because proper installation will guarantee the proper heating of all rooms in nearly all cases. However, the installer must know a great deal more about installation than hundreds of them do today. It is your job and my job to see that the installers have an opportunity to learn correct methods of installation, in so far as anyone knows what is correct.

After clearing some of the cobwebs off from the heating business, we will now proceed to see how fine an instrument we have in the warm air heating plant when well installed.

There are thirteen distinct advantages that a warm air heating system can lay claim to. I shall name them in the order of their importance as they affect home owners.

Warm Air Furnace Heating System Is More Flexible.

1. The temperature in the house may be raised to the proper condition very quickly in the morning or at other times when the temperature in the house is lower than it is desired.

2. The heating plant may be used very effectively and efficiently to warm the house for a few hours in the morning during fall and spring weather.

3. The proper humidification of the air can be carried out more effectively, more easily and with less expense with a warm air heating system.

4. The circulation of air from one room to another is more effective and makes possible the use of the air leakage in all rooms to supply outdoor air to the occupied rooms, thus eliminating the neces-

sity of open windows in occupied rooms with their attendant loss of heat and moisture.

5. The room temperatures can be kept at a more constant value than it is possible to do with other types of heating.

6. The heating plant will not streak the walls and dirty up walls and curtains like radiators do if the proper type of register box is used. Installers should be discouraged in the use of home-made contraptions that as they say, "are just as good," but in reality are a serious drawback on the future of furnace heating.

7. All rooms in the house can be properly heated just as well as with hot water or steam and the flxibility of the system by damper control makes it possible to heat some particular room more quickly or heat it to higher temperature than the other rooms.

8. The flexibility of the system makes it possible to hold room temperature at nearer the proper amount under adverse wind conditions than is possible with other types.

9. The temperature difference between floor and head level can be kept as low as that secured in hot water heating with proper installation. In other words, cold floors are not a necessary concomitant thing with warm air heating.

10. The warm air heating equipment in the room does not utilize valuable space nor does it increase the amount of work required in house clearing that the radiator does.

11. The flexibility of the heating plant makes it possible for the operator to use less fuel, if he wishes to be conservative, during a heating season than with other types and yet maintain comfortable conditions, when and where they are needed.

12. The equipment need not unnecessarily clutter up the basement, any more than other types of heating plants.

13. The cost per year during the life time of the plant is undoubtedly somewhat below the cost of other types of heating equipment excepting that of stoves.

I shall now give you a discussion of these advantages, and at the same time give you the proof upon which I base my statements.

Warm Air Furnace Responds Quickly

The temperature in the house can be raised very quickly in comparison to that by hot water or steam heating. Very frequently some one will claim that his hot water plant will heat the house very quickly in the morning. I have taken scores of records and I fail to substantiate such claims. The cause is inherent in the type of plant. For instance in a house of 10,000 cubic feet capacity, that has 600 square feet of hot water radiation we can show why it must heat up slowly. The weight of iron in the pipes and radiators would be about 3,600 pounds. This is equivalent to about 400 pounds of water as far as heating is concerned. The heating system contains about 1,000 pounds of water. The water and iron must be heated through about six times the range in temperature that the air is and this makes the water equivalent of these two six times as great as given above. The air in the building weighs about 830 pounds and is equivalent to approximately 200 pounds of water as far as heating is concerned. The weight of iron in the furnace and in the boiler will about equal each other for our discussion. We shall assume in both cases that we must heat about 10,000 pounds of building material which is equivalent to about 3,000 pounds of water. This means then that in warm air heating we have a job equivalent to heating 3,200 pounds of water while in hot water heating the job is equivalent to heating 11,600 pounds of water or nearly four times as much heat is required, to bring the rooms up to the proper temperature.

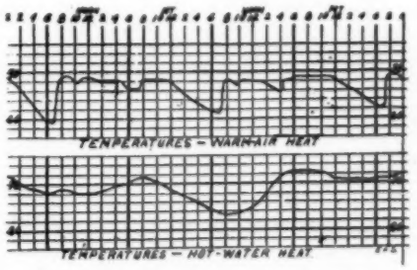


Figure 1.—Temperature Records.

The most rapid raise in temperature that I have ever secured in a hot water heated house was 10 degress in 1 hour and 10 minutes, but the damper in the chimney pipe was red hot for three-fourths of this time. This is not a practical operating condition. Even our hot water friends will agree that 10 degrees Fahrenheit raise in room temperature in two hours is considered standard practice. In fact if the temperature is made to raise faster than this the room will get too hot before the water cools down again. In reality it usually takes three or four hours for a 10 degree Fahrenheit raise in room temperature with hot water heating, while I have found warm air plants that would raise the room temperature 10 degrees Fahrenheit in 30 minutes. The graphs shown in Figure 1 are very characteristic in showing what can be done in raising the temperature in a house in the morning. These are temperature curves. The upper curve was taken in a warm air heated house and the lower one in a house heated with hot water. Both heating plants were controlled by regulators. The top record shows that the temperature was raised eight or ten degrees in about one-half hour each morning, while the lower record shows the length of time taken to bring the temperature up to 70 degrees Fahrenheit when it was only down to 63 degrees Fahrenheit. The graphs show also that the temperature in a hot water heated house is very likely to go up to a higher temperature than desired, while that in a warm air heated house is readily controlled. This shows why hot water is not practicable for supplying heat for chilly mornings in the fall and spring.

Provides More Humidity.

The air in most of our homes is too dry. Warm air furnaces are now being equipped with water pans that give fairly good service in humidifying the air. The older types

of water pans do not evaporate as much water in a week as they should do in one day. This is also the fault of most devices or humidifying pans that are used with warm water and steam heating plants. There are a few makes of water pans that can be used with hot water systems and will evaporate the

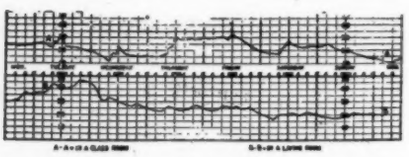


Figure 2.—Dry Air in Class Rooms and Houses.

proper amount of water. It is necessary, however, to cover all radiators with these pans and then a new problem is presented for solution. The time and trouble of keeping all of these filled with water is more than the average householder will care to take. The result is that the pans are not used.

The amount of water required for humidification is not as great as generally assumed. Our records show that five to eight gallons of water per day will produce good humidity conditions in houses with double windows and you can't use good humidity in houses with single windows during cold weather.

The curves shown in Figure 2 are eloquent testimonials of the fact that our homes and other heated buildings are in need of moisture during cold weather. The top record is the relative humidity in a class

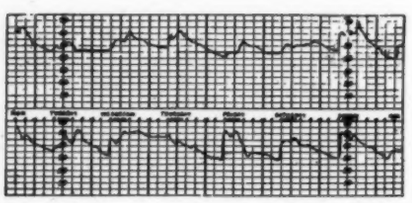


Figure 3.—Good Humidity in a Home.

room. You will note that the humidity was often below 20 per cent. This is dryer than the air in the Sahara Desert. The lowest humidity was reached on Monday morning when it was only 11 per cent, with a temperature of 71 degrees Farhenheit in the room and 4 degrees Fahrenheit below zero out-of-doors. You will note how the humudity raised each forenoon when classes were in session and note that there was no class on Sunday morning.

The lower record was taken in a living room in a home heated with hot water. There were pans on three radiators, but these did not supply much moisture. The humidity was high enough when the temperature out-of-doors was above freezing the first part of the week, but when the temperature went below freezing the air became very dry. Note that the humidity averaged about 20 per cent.

The curves shown in Figure 3 are humidity records taken in a home. This shows that very good humidity may be secured by rather simple means. The moisture in this house was secured from a tea kettle. The upper curve was taken during mild weather in December. The average temperature for the week was 29.5 degrees Fahrenheit. The second record was taken when the average temperature out-of-doors was 16 degrees Fahrenheit. The humidity decreases very rapidly at night when the tea kettle stops sizzling, but it jumps up quickly again in the morning.

It is a comparatively easy matter to show how well a warm air heating plant can perform in supplying moisture for a house. Two records were taken during the same week. The top one was taken as indicated in warm air heated house. The lower one is the same as the lower one in Figure 2. The cut also shows the temperature records for each day—giving the maximum, minimum and the average temperatures. The graphs show plainly how the water pan on the furnace kept up the humidity during the last part of the week when the temperature dropped to about zero outside. We do not consider that 30 per cent was high enough, but it is very much better than 20 per cent as was found in the other house.

The air leakage in bed rooms can be utilized to supply so-called "fresh air" to the other rooms in the house if the heating system is provided with the proper cold air ducts. A plan of a heating installation that does this will be shown in a few minutes. In one house I will give some records to show the amount of ventilation secured through air leakage in bedrooms. The total amount of air return from two bedrooms when the warm air was not turned on was 51 cubic feet per minute, while from the living room and dining rooms it was 38 cubic feet per minute.

In another case, when the heat was turned on in all rooms, but the bed rooms were at a colder temperature than the living room, the total amount of air returned from four bed rooms was 173 cubic feet per minute compared to 214 cubic feet per minute from the rest of the

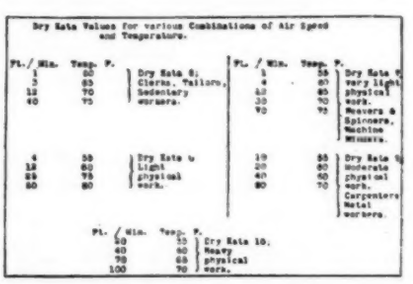


Figure 4.—Warm Air Heat Gives Highest Humidity.

house. The lower temperature in bed rooms contributed quite largely to the amount of air taken from them. In a bed room that was 8 degrees Fahrenheit cooler than a living room when the cold air from each entered the same cold air shaft with the longer run for the bed room, the velocities of the return air at the register faces was 65 feet per minute for the bed room and 25 feet per minute for the living room. Another illustration will be sufficient. In a church we found that we were taking 1,196 cubic feet per minute from the main auditorium when it was cold and no warm air being put in, while we were taking 1,210 cubic feet per minute from the basement and putting 2,300 cubic feet per minute of warm air into the basement. In other words we were getting about 1,200 cubic feet of fresh air in leakage up stairs and the same amount of our leakage down stairs. All of

these figures show how distribution of air from all rooms aids in ventilation.

Temperature More Constant.

Statement number five is "The room temperature can be kept at a more constant value than it is possible to do with other types of heating." This statement is made after scores of temperature records have been taken and these investigations carried on for a number of years.

The graphs shown in Figure 5 will indicate some of the facts found in this investigation. Someone may object to these as being conclusive evidence as they are only single cases. These are representative graphs selected from a number of this system was not changed during the week. The furnace was operated by an eighteen-year-old son. The dampers were partly closed at night instead of changing the regulator. This graph shows that outside temperatures did not influence the temperature variation much inside. One day during this time the outdoor temperature was up to 61 degrees Fahrenheit and one night it was as low as 6 degree Fahrenheit. This was our largest weekly variation in temperature for the winter.

The second record (B) was taken in a well-built eight-room house that was heated with a hot water system. The difference in variation in temperature is very noticeable.

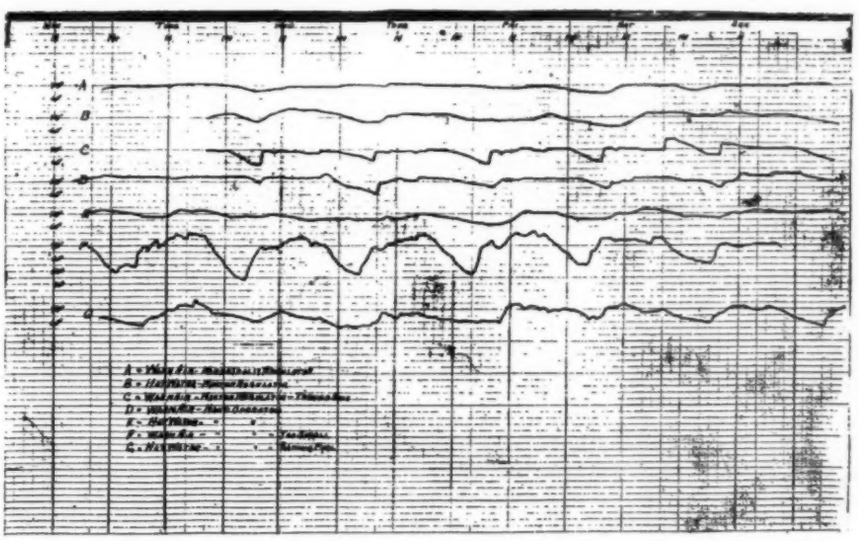


Figure 5.—Temperature Records in Seven Homes.

such records. I have many other records which show the same features.

These graphs were taken during several winters. Part of the records were taken in Kansas and part in Minnesota. I have the records of out-door temperatures and the characteristics shown in these graphs are not due to outside temperature effects. The records were taken for approximately one week each.

The first record, as the chart shows, is a record in a warm air furnace heated house. This furnace has sufficient capacity. The installation has several faults, but in spite of these, the whole seven-rooms (hall and bath in addition) are well heated. The regulator on The temperature remains low in the morning and then raises higher than it should because the regulator cannot prevent it. The two graphs on Saturday show distinctly the difference in response of the two systems after a sudden drop in temperature out-of-doors early Saturday morning.

The third graph shows the fine result that it is possible to secure with a warm air furnace of good capacity, when well regulated. I have never been able to secure a record from a hot water heated house where coal is used for fuel which approaches this in uniformity of temperature. The variation in this house from 7:30 a. m. to 10:00 p. m. is usually only two degrees. The ten degrees drop in temperature at night secures some saving in fuel. The large capacity furnace in the warm air type enables the owner to secure the proper daytime temperature in from twenty to thirty minutes after the regulator opens the draft. Note also the raise in temperature secured Saturday evening at 8:00 p. m. They wanted the house warmer for bathing the children.

The graph in D shows a more uniform day time temperature than was shown in B, even though this was a hand-operated plant. This man's thermometer was on an inside wall, but near the corner close to an outside wall. He kept the proper temperature as shown on his thermometer, but the radiation to the cold wall allowed it to register about 3 degrees low.

Hot Water System Responds Slowly.

The result shown in E of a hand-operated hot water system is as good a regulation as is secured in B. I find this to be nearly always true when operated intelligently. Low temperatures in the forenoons is quite noticeable, however.

Graphs F and G are given to show poor hand regulation of warm air and hot water systems. The one in F is the type of temperature variation that many people think is characteristic of warm air heating. That is not so. I have never secured a variation in any other house that approaches this in its irregularity. Undoubtedly the warm air gave more fluctuations in temperature than did the hot water system in G, but the variation from maximum to minimum from 8 a. m. to 10:00 p. m. is greater in the hot water heated house. Another advantage in favor of the warm air heated house was that the house was warm every morning by 7:30 a. m., even though he shut the furnace almost air tight at night, thereby saving considerable fuel. This was not true of the hot water heated house.

The fluctuation in temperature in F in the daytime was caused by poor operation. This man was above 60 years of age and had never operated a furnace until the last

three years. He was around the house most of the time and would open the drafts wide open as soon as the house began to feel cool to him. He used no thermometer. When the house was warm he would close the dampers again.

Less Variation in Temperature With Properly Operated Furnace.

The man operating the boiler in the house where record G was taken tried to see how fast a raise in temperature could be secured on Friday morning. The outdoor temperature dropped suddenly during the night to 6 degrees above zero, but came up to 22 degrees at noon. The man fired up heavily at about 9:30 because opening the draft in the morning had not raised the temperature. The temperature was raised 10 degrees in about one hour and ten minutes. This is the most rapid raise in temperature that I have found to occur in a hot water heated house in cold weather. When the temperature reach 70 degrees Fahrenheit, he closed the draft. At this time, and for nearly the whole hour preceding, the chimney damper was red hot. Note that the temperature still increased to 74 degrees after closing the draft. This is very characteristic of hot water heating.

These graphs are eloquent testimony to the need of regulators on heating systems. They also show that a regulator is more efficient when applied to warm air heating than when used on hot water heating systems. After taking a large number of records, I must say that the argument so frequently used, viz.: "Put in a hot water system so as to secure an even temperature," is not true. Warm air heating under intelligent operation or when automatically regulated will give less variation in temperature.

The curves shown in Figure 6 are very interesting. The subject of oil heating has been referred to in these meetings. The curves show one advantage of oil as fuel. The record in the chart at the right was taken in a house heated with an oil burner under a hot water boiler. Note how regular the temperature changes and what fine regulation of temperature is secured. I thought that I was going to be beaten in my contention that warm air gives better temperature regulation when I saw this record. The record shown in the chart at the left shows that I am right, however. This record was taken in a house heated with warm air. The slight drop in temperature that occurred on the two forenoons at about eleven was due to heat from the kitchen affecting the thermostat and keeping it closed, while the recording thermometer was in another room and recorded the slight drop. Note that the temperature does not vary even 1 degree Fahrenheit during a whole 24-hour period.

Proper temperatures may be secured in all rooms. These temperatures were taken in a seven-room house with six cold air ducts. The temperature out-of-doors was 12 degrees Fahrenheit with a wind of 25 miles per hour from the northwest.

House Temperatures—Head Level.

Living room,	west	71.5°
Hall,	south	67°
Dining room,	north	69°
Bedroom,	northwest	65°
Bedroom,	south	71.5°
Bedroom,	east	71.5°

This shows a very small effect due to the wind. In a hot water heated house the temperature is affected by wind in a similar way. With a southeast wind of 20 miles per hour the temperature taken in a hot water heated house was:

Living room,	east	70.5°
Dining room,	south	72°
Kitchen,	southwest	71°
Bathroom,	west	83°
Bedroom,	northwest	77°
Hall,	north	72°

This same house shows a big variation from these temperatures when the wind is in the west. The temperatures below were taken when the wind was blowing from the west at 30 miles per hour at an out-of-

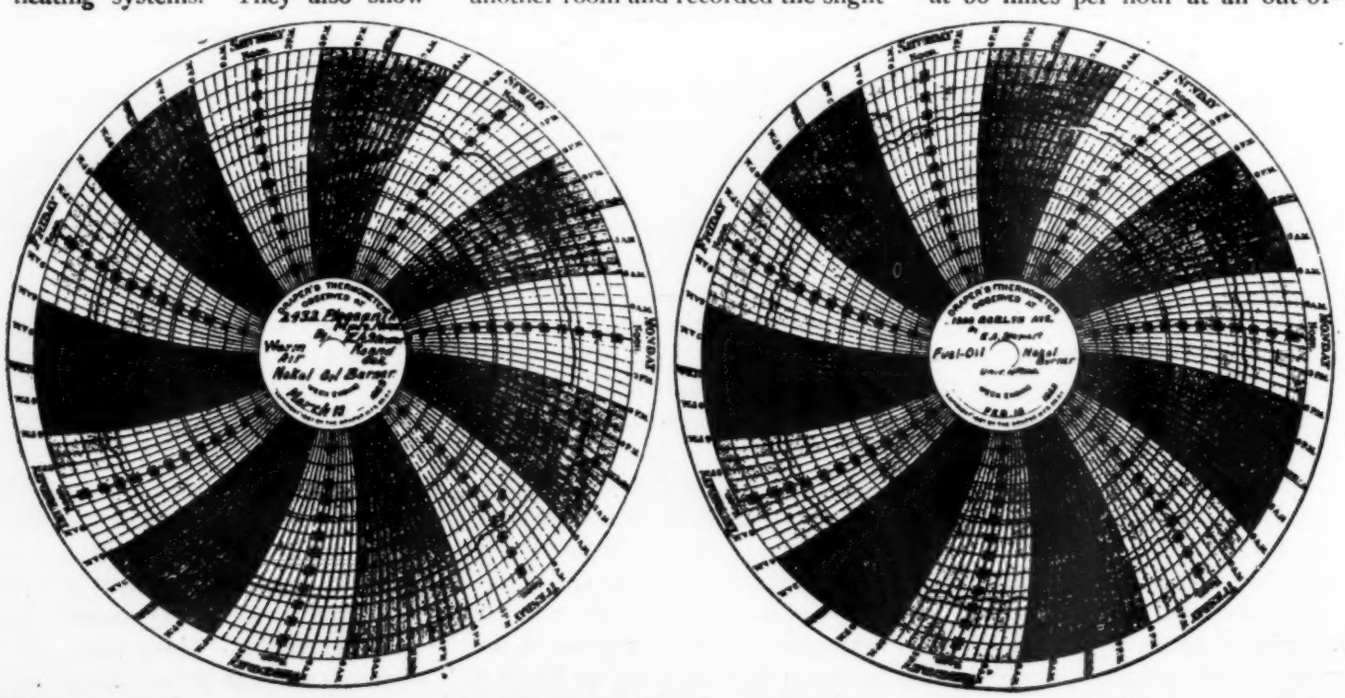


Figure 6.—Oil Burners Work Satisfactorily With Warm Air Furnaces as Shown by Thermostat Records.

doors temperature of 10 degrees Fahrenheit, which was just the same as the temperature during the time the readings above were taken.

Living room,	east	70°
Dining room,	south	70°
Kitchen,	southwest	67°
Bathroom,	west	69°
Bedroom,	northwest	68°
Hall,	north	68°

You will note the large difference in the bedroom and bathroom temperatures when the living room is kept at about the same temperature from what these temperatures were when the wind was from the southeast.

It is very important that the heating system be so designed that the house can be heated with *warm air* instead of *hot air*. The pipes and register faces must be large and the casings small. The houses that are heated with hot water usually show warmer floors, or less difference in temperature between floor level and head level than do houses heated with warm air. This is not necessary. The table given below shows three representative sets of readings taken in different houses. All readings were taken late in the morning or afternoon when the house had reached a uniform temperature.

The "Difference -1" gives the difference in temperature between the ceiling and the floor (about 2 inches above floor), while "Difference -2" gives the differences between head level and floor level temperatures. You will note that house 1 under warm air heat gave as satisfactory a temperature variation as is secured in hot water heated homes. The house number 1 in each case is the best record, while that of house 3 is a poor record. The reason why there is such a small difference in temperatures in house number 1 is because the house was heated with a large volume of warm air, while house number 3 was heated with a small volume of hot air.

The relation between the temperature of the air at the register face and the variation in temperature between the ceiling and floor is very striking. The following table gives some actual temperature records:

Temperature at Register Face	Temperature Difference Ceiling to Floor
198° F.	28° F.
162° F.	25° F.
140° F.	20° F.
125° F.	11.5° F.
94° F.	7° F.
88° F.	4.5° F.

It appears then that cold floors are not found where the system is properly designed.

The designing of the system means not only the use of properly-sized and properly-placed ducts, registers, etc., but the size of casings must be considered in relation to free air area in the heating pipes. This idea is shown graphically in Figure 8. If large casings are used the air moves slowly, becomes highly heated and is inefficient.

I have a number of views here which will show what can be done in designing a heating system that will give the advantages mentioned in the first part of my address. The use of under floor return air ducts will do away with the objection that many people make concerning the pipes in the basement. Cold air returns from all rooms or nearly all rooms, with the exception of bathroom and kitchen will do away with those so-called "cold rooms" that have lost the warm air heating industry thousands of heating jobs.

The plans shown in Figure 9 are those for heating plant which cannot be objected to on account of cold rooms or because the basement is cluttered up with pipes. The cold air returns are taken from all rooms with the exception of the small rooms such as sewing room, men's room, wash room, bath room and kitchen. The warm air pipes for these small rooms are always over size and if the cold air pipes from adjoining rooms have large capacity then these rooms will not bother about heating properly. I have tested a number of plants designed somewhat on these principals and these small rooms heat the best. The men's room in this house is on the north side, but it is usually one to five degrees warmer than the other rooms. The cause of this is readily explainable.

The basement plan is shown at the left. The furnace is well located so that all of the runs are comparatively short. The first floor bedroom has one of the longest runs but it is rather singular that the air at the register face in this room is often higher than in the other rooms. The cold air returns are placed under the basement floor as shown. The galvanized iron cir-

House Temperatures.

Warm Air Heat				Hot Water Heat		
1	2	3	House Number	1	2	3
67.5°	73.5°	88°	Ceiling temp.	71°	69°	71°
67°	68°	73°	Head level temp.	70°	67.5°	68°
63°	62°	60°	Floor temp.	67°	63°	63°
4.5°	11.5°	28°	Difference -1	4°	6°	8°
4°	6°	13°	Difference -2	3°	4.5°	5°

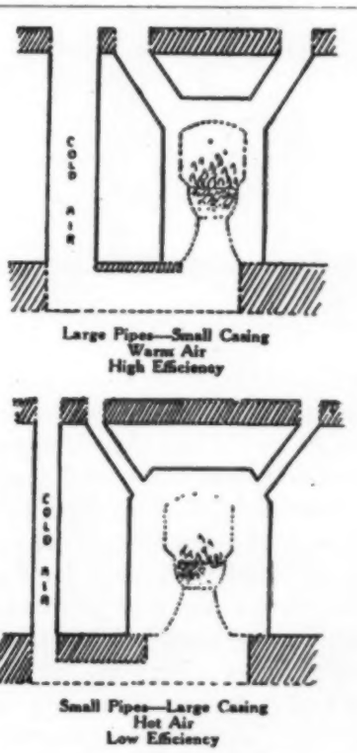


Figure 8.—May Casings Be Too Large?

cular ducts run from the register boxes straight down and open into the rectangular ducts below. All four cold air ducts meet in a central pit under the furnace. A test of this plant shows that all cold air returns operate very well.

Plain Asbestos Does Not Act as Insulator.

We find very frequently that furnace installers are still inclined to use the plain asbestos paper as an (so-called) insulator for the warm air pipes and for the furnace. They tell me that people want it for the looks of it or because they believe that it is better than nothing. I do not have any difficulty in keeping it off on jobs that I have anything to do with.

I show in the next film one of the finest proofs that it is better to keep the asbestos paper off from the basement warm air pipes. The curves on this record also show that poor damper regulation may be the cause of high fuel bills and warm basements. The temperature records for this chart were taken for three consecutive weeks (our records also were for one week before and also another week after) in the basement of a home. The close uniformity of outside temperatures as given on the chart was a lucky accident. All three weeks being very cold weather—below zero every night. The top line record was taken just as we found the furnace installation. The damper control was then corrected and the second solid line shows that we decreased the average basement temperature about 5 degrees. The third or dotted line is the most interesting. The installer had a man remove the asbestos paper from the warm air pipes on Tuesday of the third week. Note what happened to the basement temperatures when this was removed. The saving in fuel was very marked in the case of this home, by these two simple remedies.

With installations of this type we are proving that warm air heating has all of the advantages which were claimed for it in the first part of my address.

Good Warm Air Heating Service at a Fair Profit Will Bring Fullest Measure of Success.

Roy C. Walker Says There Is No Other Way to Gain Real Success in Warm Air Furnace Business.

SELLING good warm air heating service at a fair profit, is the watchword for the successful installer, according to Roy C. Walker, Manager of the Meyer Furnace Company, Peoria, Illinois, who in the following statement points the way for the man who wants to build a profitable warm air furnace business:

We cannot see one thing now, in the way of warm air furnace installers selling good heating service at a fair profit. The manufacturers who comprise the National Warm Air Heating and Ventilating Association have made possible the Code which, if followed, will result in first class installations.

These same manufacturers have exchanged and adopted manufacturing methods to reduce the cost of production and have worked hard to keep costs down in order that the installer could make more sales.

Service has been the watch-word, and today the warm air furnace industry occupies a far higher position of respect in the building and heating industry than ever before.

We believe it is now up to the installer to take advantage of the fact that he can purchase well-made, capable warm air furnaces at a reasonable price and can install them in accordance with a Code that guarantees a well satisfied boosting customer.

Therefore, as I see it, the installer (if he has not already done so) should now adopt the budget system of accounting, watch his costs as carefully as his installations, be sure he makes a fair profit—no more, no less—and thus give encouragement to those who follow us, in order that the wonderful improvements in our industry may continue.

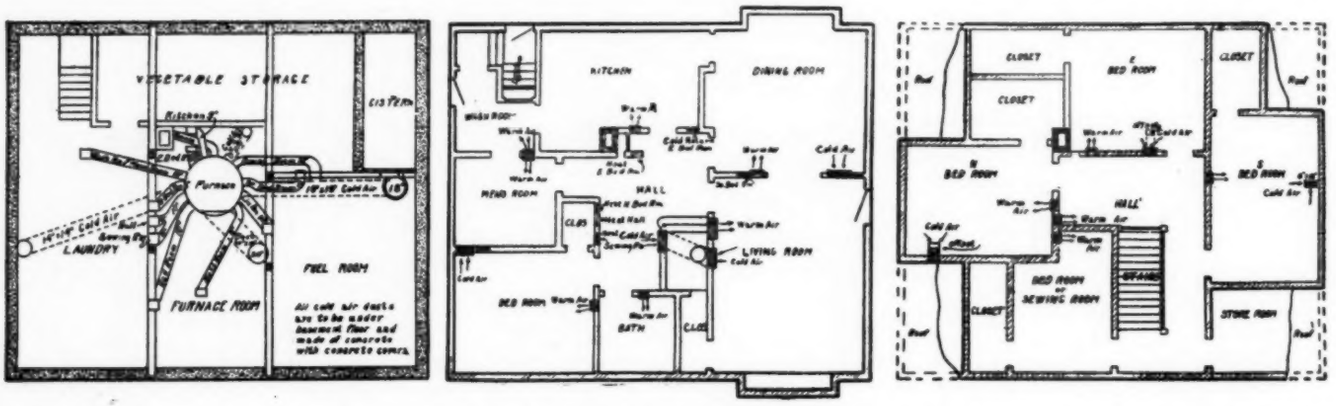


Figure 9.—Plan for Warm Air Furnace Installation That Gives Full Satisfaction. Cold Air Registers In All Main Rooms.

A noted dealer in an Ohio town has learned that, although technically there is a distinct line of demarcation between things automotive and things electrical, the customer does not stop to figure out the difference when he is in need of either or both, but goes where he can get what he wants.

Overhead Pipe System for Heating Factory Building Without Basement Is Operated With a Fan.

One Warm Air Furnace Heats General Work Room and Offices While Another Heats Drying Room.

THE accompanying illustration and description furnishes a fine example of a warm air heating plant for a factory building, 120 x 65 feet, without a basement. The plan was drawn by Wilson H. Haller, of the Engineering Department of Haynes-Langenberg Manufacturing Company, St. Louis, Missouri, whose description follows:

This plan is one of the many buildings used by the Pittsburgh Plate Glass Company as a work shop and show room with a small local office. It is unusual because of the great variance of temperatures required. In the main shop a temperature of 55 to 60 degrees is required, 70 degrees in the office, while the chipping and drying rooms must be kept to a temperature of 120 degrees the year round.

To bring about the desired results we have installed two "Front Rank" steel furnaces in the manner indicated in the plan. The units are independent. The small unit takes care of the drying and chipping room only and affords a continuous and rapid change of air at a high temperature, the large industrial unit providing heat for office and shop during winter months only.

There being no basement in the building, the furnaces were placed on the same floor level as the spaces to be heated. Both furnaces are connected to the same flue, as shown on the plan. The entire heating capacity is taken off the top of each heater through one large round pipe, each pipe being connected to a volume blower of ample capacity which forces the heated air through the main warm air duct, then into the branch pipes to the spaces to be heated. The cold air return to the large heater is taken from the factory proper, while the return to the small heater is from the chipping and drying room.

Only 55 Per Cent of Furnace Installers Are Association Members.

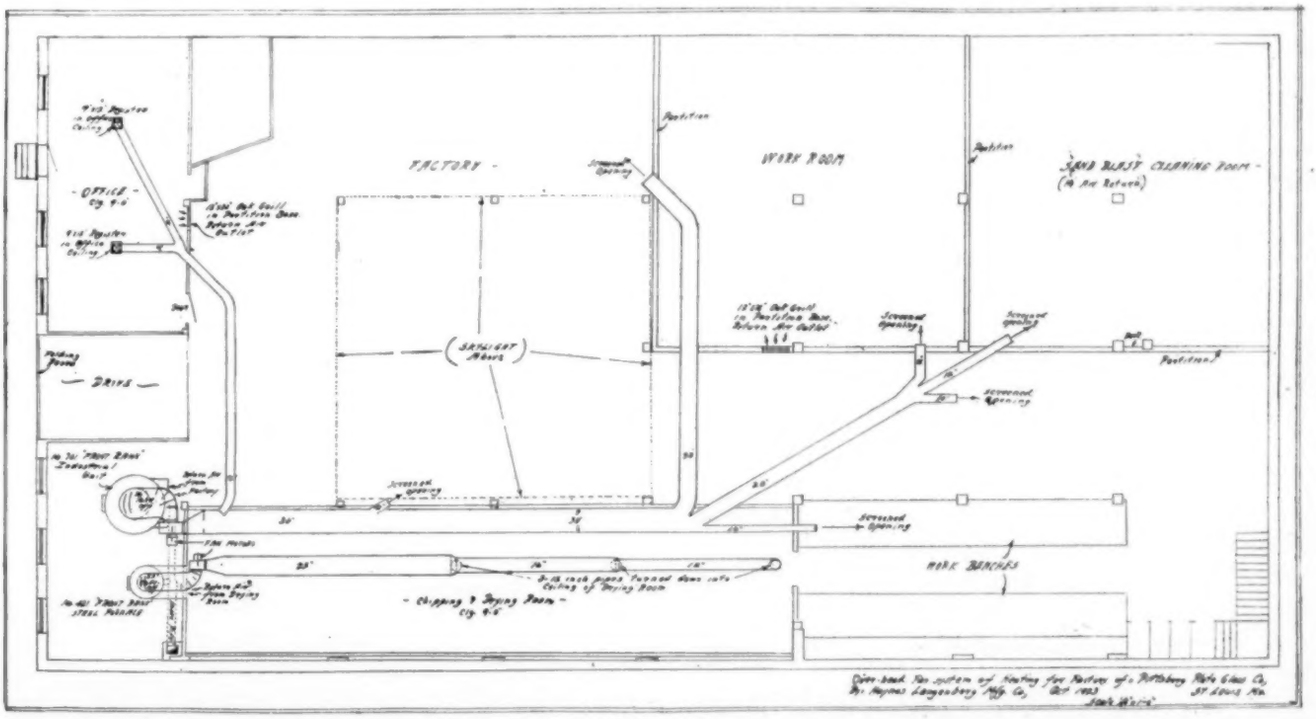
Here's a tip for the chairmen of the membership committees of Warm Air Furnace associations.

Being desirous of determining just what the furnace installers think of their industry, AMERICAN ARTISAN Warm Air Furnace Special Questionnaire asked whether or not the installer belonged to any association connected with his trade, and if so, whether he attended the conventions regularly. Fifty-five per cent of those installers answering the question stated that they did belong to an association connected with their trade and 70 per cent of these attend conventions regularly.

Several of those installers in the 45 per cent who did not belong to any trade association said they would be glad to join if they were solicited.

Shall we call this an oversight on the part of the membership committees? Anyway here's a tip which we are certain they will appreciate.

If you take good care of the little tasks as they come along, the big tasks will take care of themselves.



Plan for Warm Air Furnace Installation in One of Pittsburgh Plate Glass Company's Buildings in St. Louis, Missouri. Heat is Carried in Overhead Pipes from Furnaces on Same Floor Level as Factory.

How a Sick Furnace Job Was Changed Into a Really Efficient Warm Air Heating System.

Engineering Department of Meyer Furnace Company Diagnosed the Case Correctly and Furnished Sufficient Cold Air to Furnace.

THE following interesting article with illustrations showing how a "sick furnace job" was changed into an efficient warm air heating plant is from the Engineering Department of the Meyer Furnace Company, Peoria, Illinois:

In the accompanying illustrations are shown tracings of two different heating plants for the same residence. The original plant never gave satisfaction. However, the furnace was not to blame, because it was amply large enough to give perfect satisfaction had the installation been correct.

The original plan no doubt will be self-explanatory in showing the incorrectness of this system and the revised layout will show what had to be done in order to put this heating plant in working order.

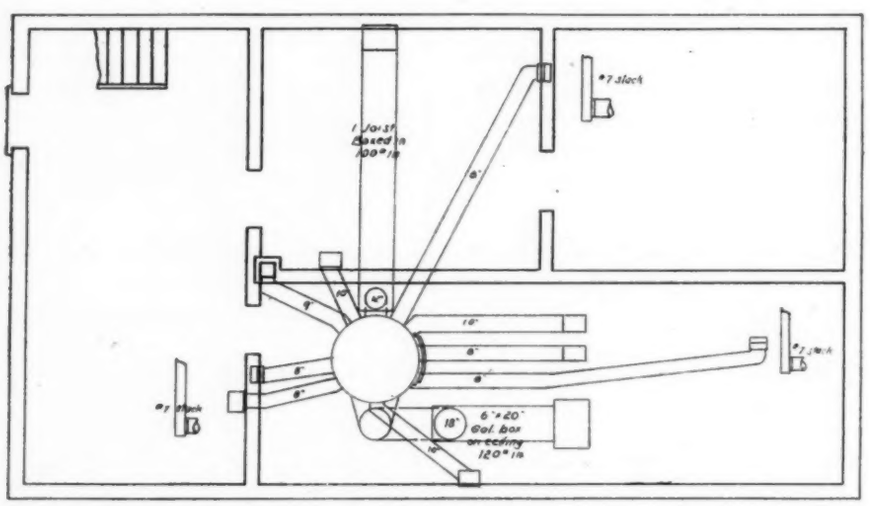


Figure 1.—Original Basement Plan for Warm Air Furnace Installation Which Was Unsatisfactory.

A few of the defects we had to take into consideration were the boot connections to second floor rooms. These were very poor, merely collars tapped into the side of vertical stacks; in the new layout they were all changed to standard boots, allowing free and unrestricted flow of air. The leaders to these rooms were also increased. The kitchen leader was also increased, as an 8 inch pipe was entirely too small. A 10 inch pipe with the aid of a kitchen range will now give plenty of heat to this northwest room.

There are still a few defects on the warm air side of the job which

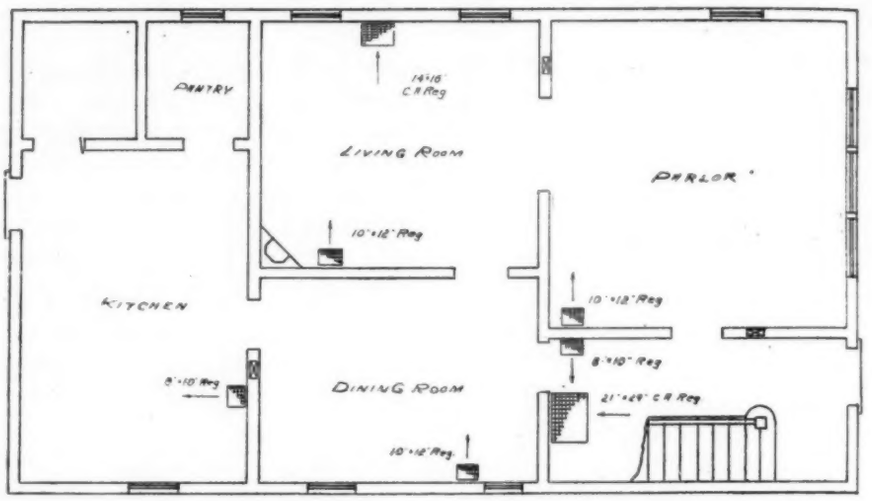


Figure 2.—Original First Floor Plan—Not Correct.

are not in accord with the code but these were left in order to save expense. However, if they do not give satisfactory service in the new system we still have the right to change them. These changes would be to move the dining room register from the outside wall and increase the parlor register to 12 inches.

Another thing we strongly object to in the old layout is warm air pipes coming off over the front of furnace, as very little service can be expected of a pipe taken off in this manner.

The following schedule will show the incorrectness of the warm and

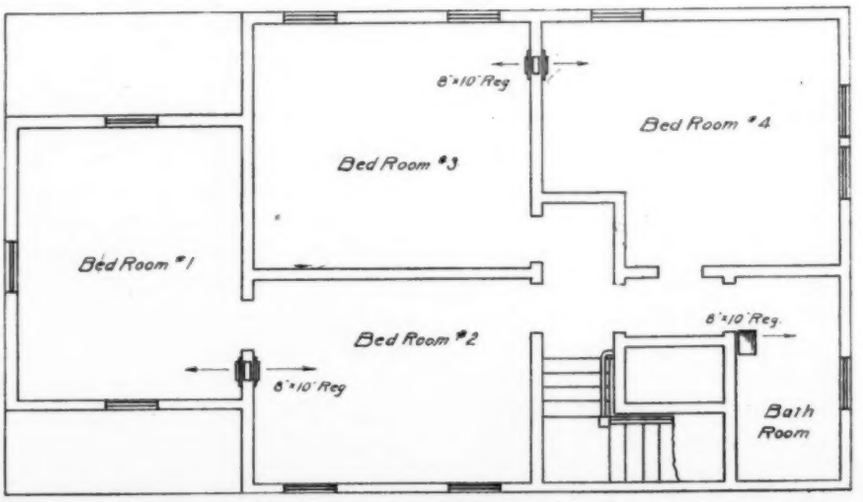


Figure 3.—Original Second Floor Plan—Not Correct.

cold air pipe sizes in the old layout:

Old Layout.

	Warm Air Pipe Size	Area	Cold Air Area
Kitchen	8	50	
Dining room...	10	78	
Living room...	10	78	100
Parlor	10	78	
Bed No. 1 & 2..	8	50	
Bed No. 3 & 4..	8	50	
Bath	8	50	
Hall	8	50	120
Total		484	220

New Layout.

	Warm Air Pipe Size	Area	Cold Air Area
Kitchen	10	78	
Dining room...	10	78	201
Living room...	10	78	254
Parlor	10	78	
Bed No. 1 & 2..	9	63	
Bed No. 3 & 4..	9	63	
Bath	9	63	
Hall	10	78	254
Total		579	709

From this schedule you can see that the cold air supply in the old job was not even sufficient to supply the leader area by over 250 square inches and the leader area was not large enough to supply the required amount of heat.

Now, on the cold air side of the original layout we had the following defects to take into consideration. The capacity of the 18 inch cold air was cut down to 120 square inches by a 6x20 duct on ceiling.

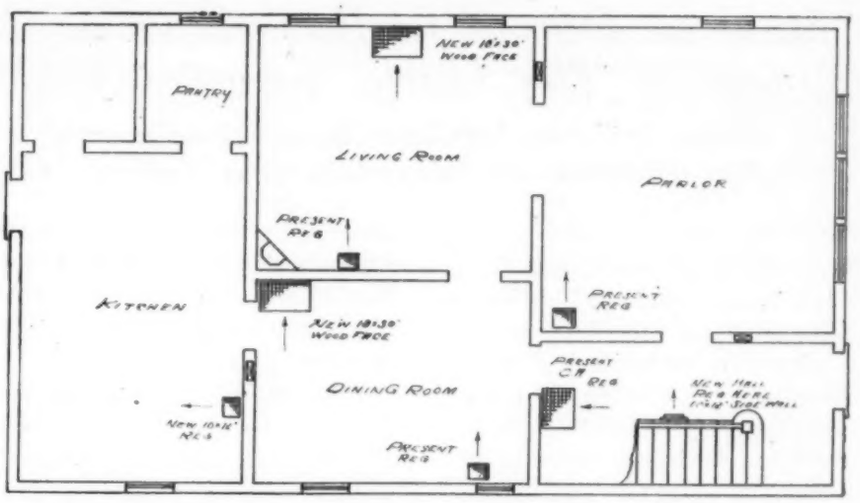


Figure 5.—Revised First Floor Plan—Note Changes from Figure 2.

The 12 inch cold air return was also cut down by boxing only 1 joist. The efficiency of this cold air return was further decreased by coming down between the furnace and wall, the space between the wall and furnace casing being barely large enough for a 12 inch pipe. Therefore, the heat from the casing was bound to decrease its efficiency.

The cold air supply on the new job is 130 square inches in excess of the warm air leaders and the job is now giving perfect satisfaction.

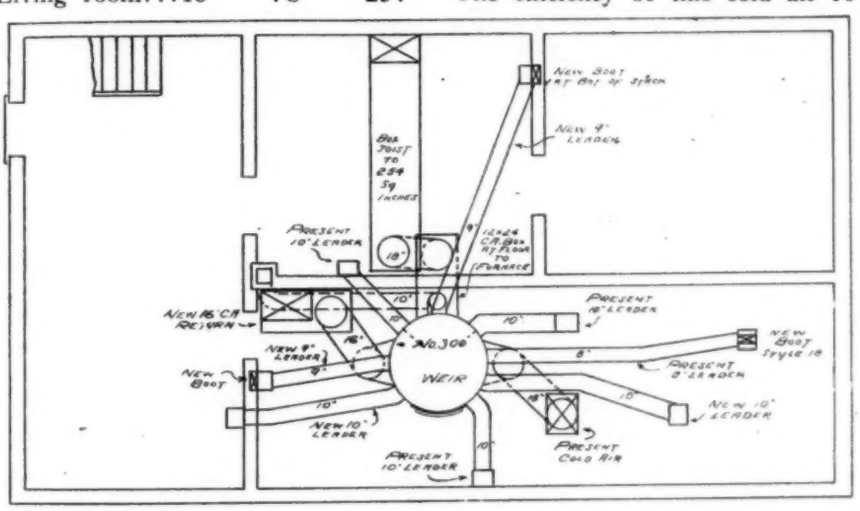


Figure 4.—Revised Basement Plan for Warm Air Furnace Installation—Operates Well.

Manufacturers Equally Divided on Assisting Installers on Long-Term Financing Plans.

One of the questions asked by AMERICAN ARTISAN questionnaire was, "Do you assist your installers in the matter of long-time financing plans?"

For some unaccountable reason the answers received were equally divided, 50 per cent saying that they did assist the installer and 50 per cent that they did not. The majority of the answers were simply "yes" or "no."

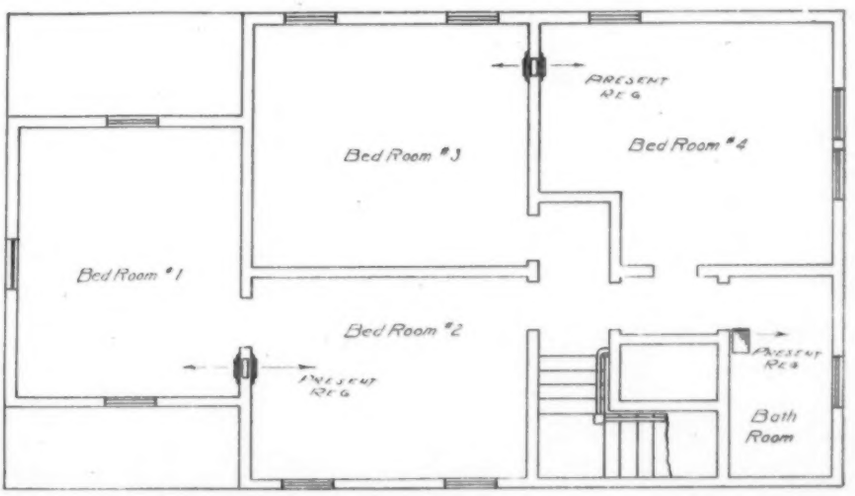


Figure 6.—Revised Second Floor Plan—Note Changes from Figure 3.

"Make the Demand for Better Business," Is Keynote of This Highly Instructive Article.

Warm Air Furnace Installation Shown In Accompanying Illustrations Has Many Outstanding Features.

IN this article Brown & Doyle, Consulting Engineers of the Farquhar Furnace Company, Wilmington, Ohio, emphasize the importance of having the "preliminaries" to the installation of a warm air furnace plant properly attended to before the actual work is to be done.

What is meant by "preliminaries" is fully explained by the authors in the first section of the article, while the second section describes some of the principal features of the installation which is shown in the accompanying illustrations:

A study of the furnace heating system, details of which are shown in the accompanying plans, is interesting especially as the work entails many points of installation such as confront the master heating contractor in the heating and ventilating of the so-called modern home of today.

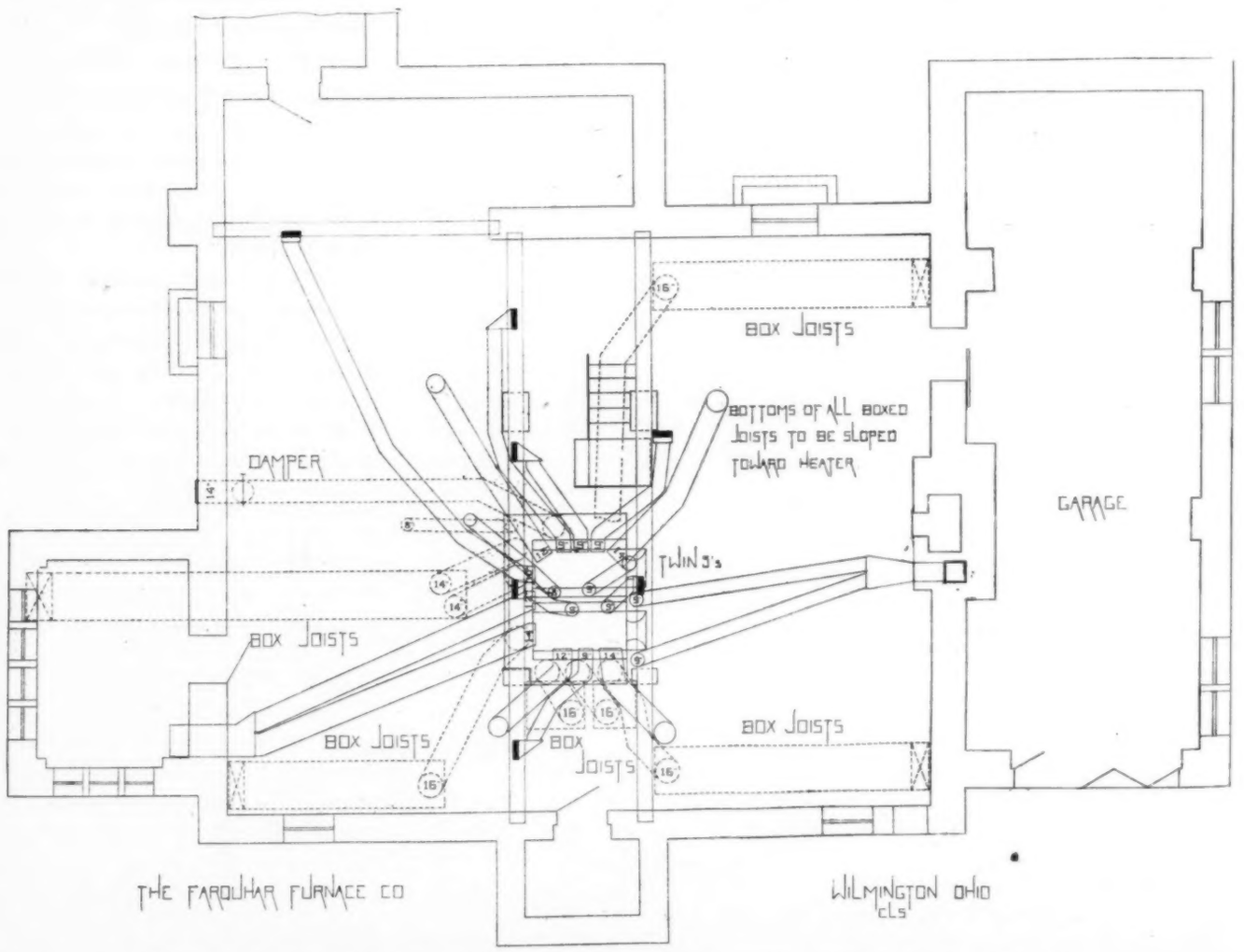
Originally, the one thought prevailed, "For the common, small dwelling warm air is practical, but in the larger or better appointed homes hot water must be used."

Due to the higher standards brought forth by a few of the leading manufacturers, this old idea has been conclusively proved erroneous, because today our finer and more costly homes are being satisfactorily heated and ventilated through the medium of warm air.

As previously stated, higher standards of construction attained by the manufacturers together with carefully worked out details by the engineer, have established positive, known possibilities with reference to heating efficiency and healthful air conditions for the salesman and installer to present to the home owner.

As it is our desire to make this article helpful to the installing contractor, there is one point we wish to emphasize at this time: In the presentation of his proposition, he should be thoroughly conversant with each and every detail, and as a suggestion, he should refrain from the use of old, obsolete, technical terms that many of the less informed members of the trade are endeavoring to revive, for no other purpose than to evade real details and to falsely further their apparent ability as engineers.

A real salesman or installer is not obsessed with the idea of his engineering ability, but instead, is a



Basement Plans for Twin Furnace Setting by Farquhar Furnace Company, Wilmington, Ohio.

student striving in every way to keep abreast of advanced ideas of installation as established by close adherence to safe limits in figuring capacities and strict, carefully worked out principles of installation.

There are many points of vital importance entering into the successful pursuance of the business which the installer must, for himself, decide. He must adopt some sane, limiting method of figuring. Study the constructive proportions of the heater and its ability with reference to furnace efficiency before accepting the stated ratings, which in many cases will be found overestimated.

Complete working drawings should be made and presented to the architect in order that they may be incorporated in the blue prints, and the locations for heater, pipes and registers be adopted before that of plumbing and electric wiring. The latter, because of ease in avoiding obstructions, logically should not have right of way.

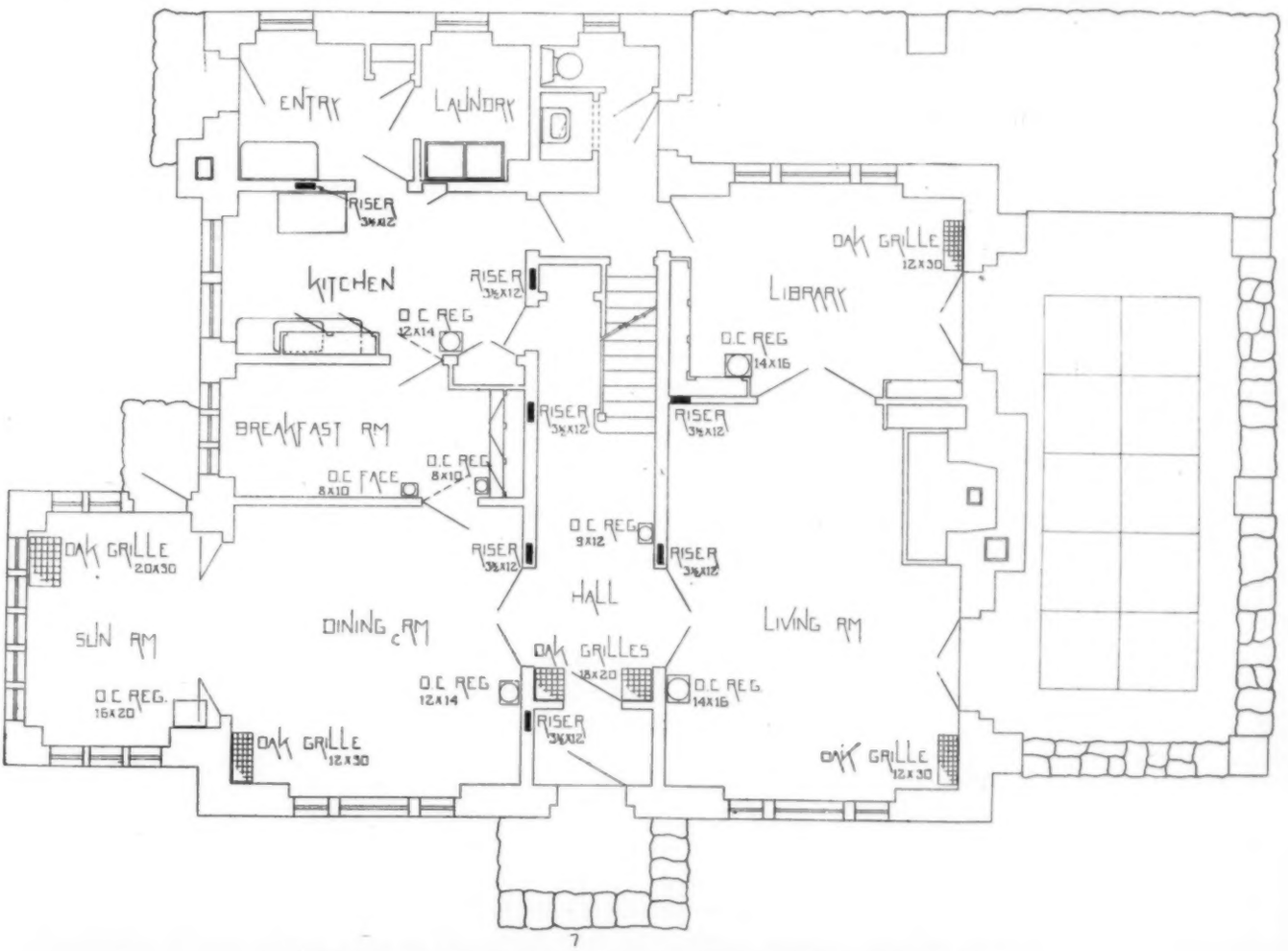
In many cases small changes in the house plans, such as moving a door, spacing of studding and girder construction, which in no way interfere with the convenience within the home nor mar the architectural design, will permit more direct lines of warm air piping. Such changes will completely eliminate long floor boxes of slight elevation to second floor rooms, as well as long angular lead pipes in basement. Girder construction should be flush with the bottom of the joists, thereby evading a false impression as to possible elevations.

The basement stairs or a large chimney base in the center of the building should be avoided. The basement depth should be in proportion to the length of the warm air lead pipes. In the selection of locations for pipes and ducts the position of the heater should be remembered in order that the warm air piping be equalized in length.

The chimney should be straight, of tight construction, good height and proper area. An inside flue is always preferable. Avoid, if possible, long narrow flues.

Mechanical perfection of installation will merit careful attention on the installer's part, as in many cases the outward appearance will add greatly to the satisfaction of the owner. Getting material on the job before attempting the installation will eliminate delays and confliction between the installer and fellow tradesmen. When the installation is finished the removal of unused material and a cleaning up of the premises add greatly to the owner's appreciation of his efforts. Many such points might be elaborated upon, but can be more briefly stated in, "Adopt a system, use it, make it a part of each installation."

To gain a central location for the heater in this particular installation, it was necessary to move two sup-



Plan of First Floor, Showing Location of Risers, Grilles and Registers.

porting pillars, cellar drain trap and turn the basement stairs by using a platform at bottom. These slight changes added no extra expense nor in any way interfered with the building construction, but from a heating standpoint they made possible the equal distribution of warm air pipes from the heater.

A study of the piping layout and room exposure will show larger capacities than is customarily used in warm air heating. The wall stacks and their connections are in correct proportion to the basement lead pipes, friction being reduced to the minimum, and are designed with the idea of the duty they are to perform and not the walls in which they are housed.

By the use of such capacities two paramount principles are gained: Air is delivered to the inter-room circulation in a greater quantity, at a lower temperature and in a volume sufficient to make possible adequate ventilation.

The return air grilles are located with relation to the greater cooling surfaces of the building regardless of location or distance from the heater. The return in the hall is of sufficient capacity to properly care for the return air of the second floor rooms.

These return air ducts are not obstructions in basement headroom, but instead are constructed with fall to outlet by boxing the joist with galvanized sheets on sides and bottoms. All returns are scientifically distributed so as to avoid bothersome or dangerous drafts upon the floors.

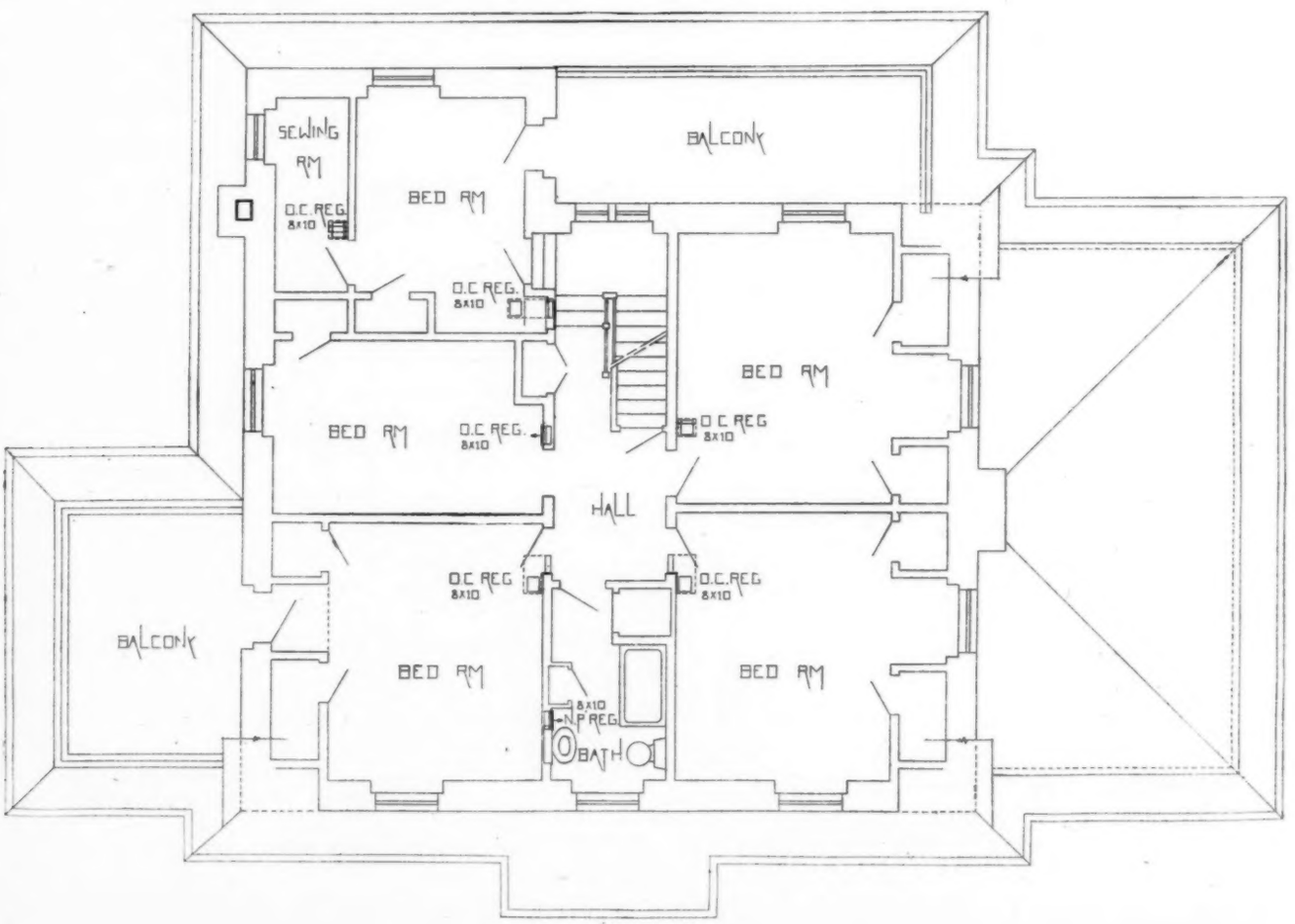
In order that the return from the library be out of headroom the 16 inch pipe leading from the boxed joists follows beneath the basement stairs into the settling chamber of the heater casing at the side.

To insure best results, the piping off of warm air and back of return air is equally balanced, with additional outside supply of sufficient volume to guarantee at least 2,500 cubic feet per hour for each occupant of the house.

In this connection, we are proud to inform you that in perfecting the FarQuar System we originated this method of piping and have been incorporating the idea in our layouts for the past twenty-five or thirty years with the result that all rooms are uniformly heated. That this plan, however, may prove successful, there must be ample space between the casing and the fire-box for an uninterrupted and ample air supply.

By adding together the exposure of each room one will find the combined exposure to be 1,025 square feet which, owing to length, elevation and friction, necessitates 1,370 square inches of cross sectional area of warm air piping.

Due to the convenience of using commercial sized piping, which in many cases will be found to exceed the requirements of certain rooms,



Plan for Second Floor, Showing Location of Risers and Registers.

we must advocate the installation of heaters with sufficient capacity to care for the cross sectional area of the warm air piping, regardless of the heater's ability to warm the specified exposure.

In this installation we have incorporated a twin setting, composed of two Number 5 FarQuar electrically welded, one-piece, fire-box units with combined grate area of 9.14 square feet and prime heating surface of 112.76 square feet. Both units are automatically regulated.

In the larger of his proposed installations the heating contractor will find the twin setting to meet with favor on the part of his prospect, for during the spring and fall, when only mild fires are necessary, one unit will nicely temper the rooms. As the two units are installed under the one casing, the circulation of air to the warm air piping is not greatly affected by not firing one of the units. Greater economy of fuel consumption is also insured by this style of installation.

With the cooperation of the architect and building contractor our Company has had the privilege of heating and ventilating some of the finest residences in this country, homes costing from forty to eighty thousand dollars. The owners undoubtedly experience not only as uniform, but more stimulating temperatures, and in addition enjoy, due to adequate ventilation, a pure, fresh, invigorating atmosphere that is not possible with the direct systems of heating.

And all at less cost.

This is indicative of the fact that the warm air heating contractor has a wonderful field for expansion and by working in harmony with the architect can place the industry upon a higher and more profitable plane.

Trowbridge A. Warner Urges That Installers Select Better Grades of Warm Air Registers.

Register Man Calls Attention to Fact That Registers Are Only Portion of Equipment in Sight Above Basement.

BACK in the days of 1918, "Trow" Warner and his "side kick," Bill Laffin, were in the thick of the fight over in France. After the Armistice they were drafted into the "morals" division and helped shorten the long evenings for the troops who were waiting for boats to carry them back to America. "Trow" and "Bill" were "black face" artists and had a fine stunt. Today they are running the sales department of the Tuttle & Bailey Manufacturing Company, and Mr. Trowbridge A. Warner is bossing the job in New York City, while Mr. William Laffin, who, by the way, has been converted from his notion about single blessedness, is in charge of the Chicago Branch.

In the following, Mr. Warner gives a bit of good advice as to registers:

"Would that I were gifted with the tongues of angels." That was my first thought on being asked to help along with the Warm Air Furnace Special of the Grand Old AMERICAN ARTISAN AND HARDWARE RECORD.

"Pete" wrote, "Make it a black faced or any other way you like." I am wondering whether he meant that my offering might be of a dark hue or slightly off color.

Well to be serious, there is one thing of vital importance in the warm air installation game that I think has been overlooked, without thought, by a number of furnace men. It is the quality and appearance of the registers they use. They buy a high grade furnace and select their tin and fittings with great care and then accept any old kind of registers. Do you realize that the register is the only article of the entire furnace job that is seen every day by the home owner and his guests? There are lots of excellent registers on the market which would be a credit to anyone's home. Why try to save a few cents by putting in something cheap and shabby? Buy the finest style of registers that you can get and if necessary charge part to advertising, because believe me, it is real advertising and the best you can get.

One thing more, don't carry the standardization idea so far that you lose all your individuality. Some of the manufacturers can give you standard sizes but can vary the designs slightly, thus making it possible to change the design, even after all fittings are installed.

Trowbridge A. Warner,

Quality is the thing that counts —quantity will follow. Make your customers and their friends say, "Go to Bill Jones for your furnace needs, because he puts in a real quality job, and the registers he uses are 'a thing of beauty and a joy forever.'"

A Fool there was, and he made his prayer,
Even as you and I.
And he claimed competition was very unfair,
For he stated his errors were seldom and rare,
But for quality work he gave not a care,
And he bought the cheapest goods money could buy,
But not as you and I.

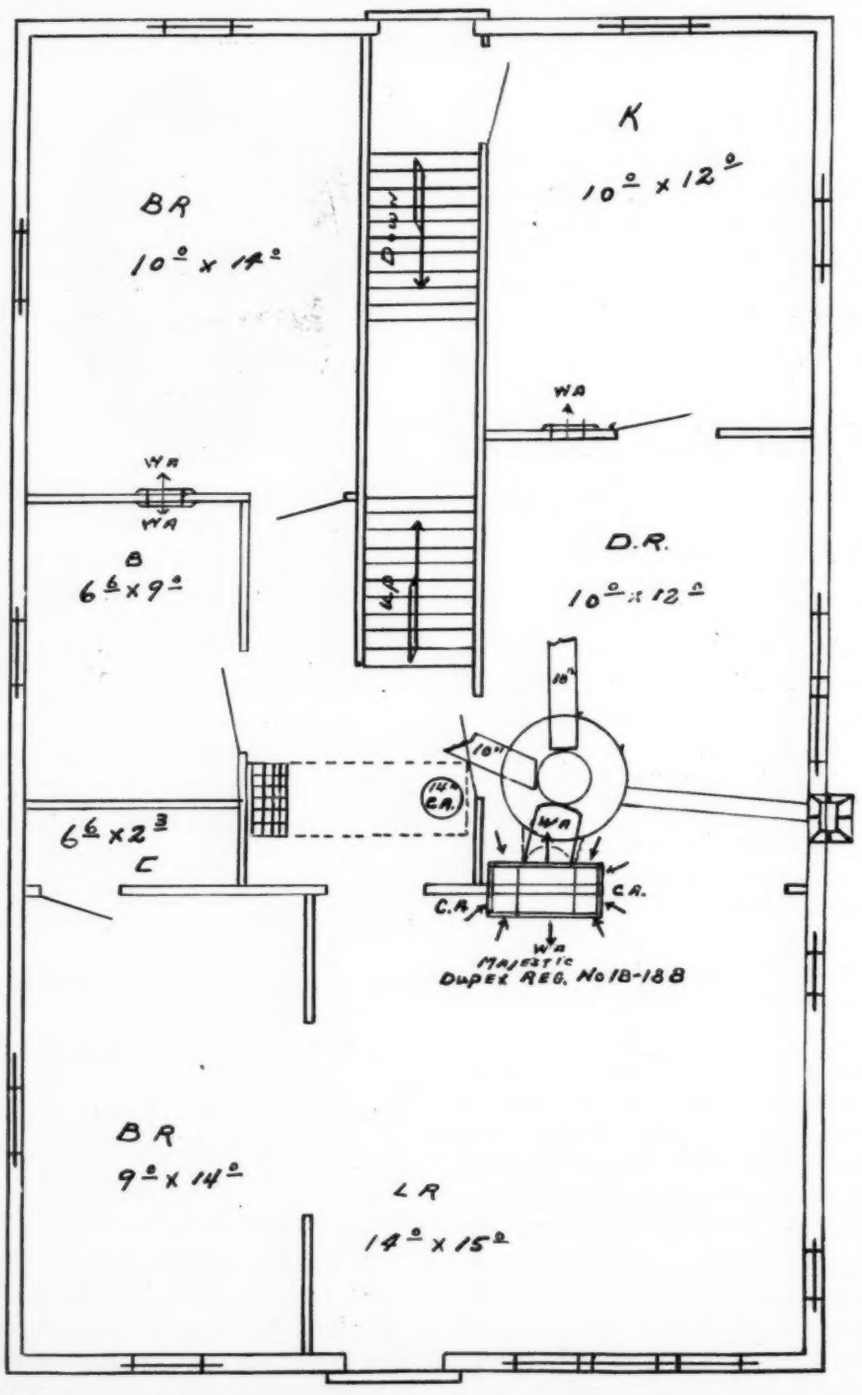
Be genuine, fair, considerate, tolerant, patient, and if, in spite of all your efforts, your prospect turns you down, see that you leave with him the memory of a meeting with a real man, and next time you call you may get his order.

Installation Plans for Compact Homes Provide for Duplex Registers and Extra Pipe Runs.

Difficulties That Are Difficult to Overcome in Typical One-Register Jobs Are Easily Solved By Use of Duplex Registers.

IN THE accompanying illustrations are shown two installations of warm air furnaces, each one featuring a distinct type of duplex registers. The plans were furnished by the Engineering Department of the Majestic Company, Huntington, Indiana, the descriptions being outlined by D. A. Purviance, Secretary of the Company:

The two sketches herewith show two very simple installations that are commonly used. One with the style B Majestic Duplex Register and the other using the style C Majestic Duplex Register.



Plan 1.—Installation Plan for Warm Air Furnace with Duplex Register and Two Pipe Runs.

In plan 1, we have used the Majestic style B register built in the colonnade between living room and dining room. This register has an 18-inch warm air and 18-inch cold air return, delivering heat directly into both the living room and dining room and likewise taking cold air back from both of these rooms.

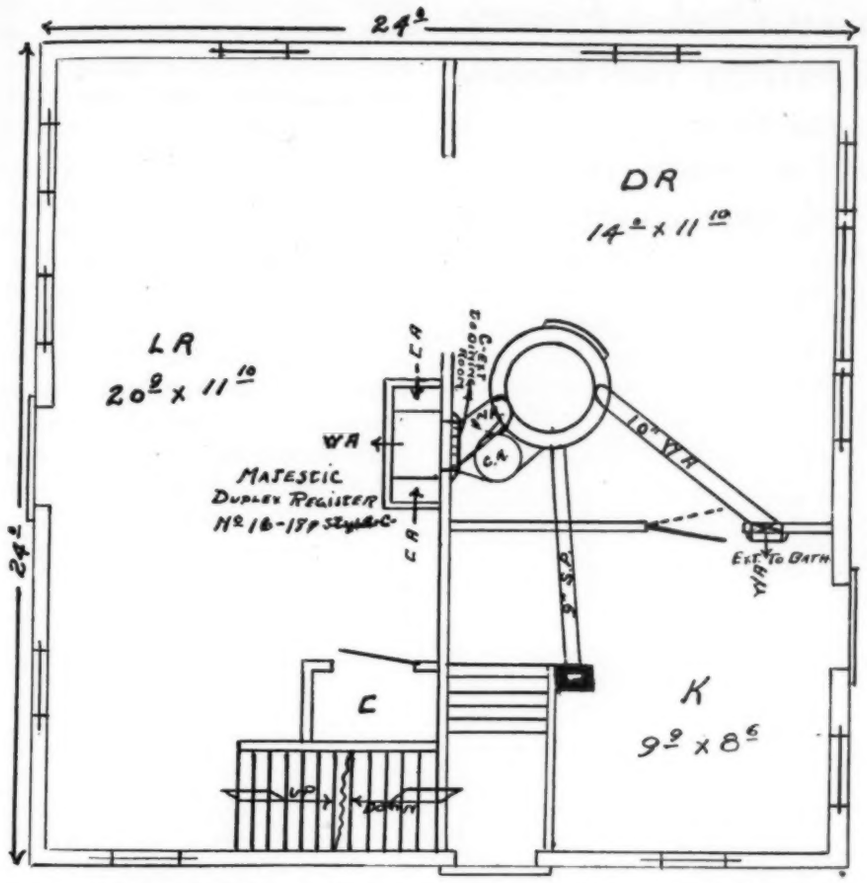
In addition we have taken a 10-inch warm air run back to the kitchen and a 10-inch run with double side wall register to the partition between bath and back bedroom. In order to offset the additional warm air taken off from this installation, the two 10-inch runs, we are taking back a 14-inch cold air from the hall.

In this installation we are delivering 410 square inches of air and taking back 408 square inches.

The idea of the Majestic Duplex System, which can be used in connection with any warm air furnace using the pipe casing, is to take care of the main part of the home and to install special warm air runs to any out of the way or hard to heat rooms. This, as you know, was questionable when the floor-level type pipeless furnace with double jacket was used, as the floor-level type pipeless is primarily a one-register system.

Plan 2 shows the installation of the Majestic Duplex System, using the style C register. As you will notice, we have used the style C register in the living room, with extension running through the partition to dining room, using 11x13 face. On this installation we use a 10-inch run back to kitchen, with an extension running up to the upstair bath. In order to offset the extra warm air taken off of the furnace by the kitchen run, we have a 16-18 Majestic Duplex Register which delivers 16 inches warm air and takes back 18 inches of cold air.

This installation requires very little room in the basement, which is one of the main talking points in connection with any Majestic Duplex System, whether used singularly or in connection with pipe jobs to take place of three or four down-



Plan 2.—Installation Plan for Warm Air Furnace with Duplex Register and One Pipe Run.

stair runs. In all installations, however, we recommend a separate warm air run to the bath in order to make certain that sufficient and steady heat is delivered there, which may not always be possible, particularly when the bath room is exposed.

Size of Water Pan in Furnace Depends Entirely Upon Frequency of Refilling.

Installers Differ as to Size; Many Show Preference for Automatic Filling Servsce.

THE question of obtaining the proper humidity conditions when making a warm air furnace installation is uppermost in the mind of each installer. The size of the water pan, therefore, that will be required to provide the proper amount of humidity is a problem which must be answered.

The questionnaire sent out to furnace installers for information for AMERICAN ARTISAN 1923 Warm Air Furnace Special contained the following question relative to the size of water pans:

"How large should the water pan be to supply sufficient humidity without filling more than once a day?"

Frank R. Jarrell, Hoopeston, Illinois.

The size of the water pan would depend upon its location in the furnace, but if I were building a furnace in which the requirements were for a tank to be filled only once a day, I should allow for a pan with a 5-gallon capacity.

L. F. Sutterer, Perryville, Missouri.

We favor the automatic filling pan.

W. A. Covell & Son, Waterloo, Iowa.

The pan should be connected tc an automatic filling device and it should be of about a 3-gallon capacity.

E. L. Hyre, Saybrook, Illinois.

The size of the pan that will be required will depend upon the size of furnace, the amount of space to be heated, and the temperature required.

Liberty Specialty Company, Conneaut, Ohio.

On furnaces in which we are using the water pan, it has a 2-gallon capacity. This size does not require filling more than every other day, except in extreme cases where furnaces have to be fired heavier than usual due to faulty construction of building.

C. R. Oberholtzer, Angola, Indiana.

The size of the pan will be made in accordance with its location in the casing. It will range from three to five gallons in capacity.

Thomas Baird, Baird-Swannell, Incorporated, Kankakee, Illinois.

That depends upon the diameter of the furnace casing and the cubic feet of air space in the home to be heated. The capacity of the tank should be from five to ten gallons if the casing permits the passage of sufficient volume of air to take up the moisture.

A. H. Cobb, Jackson, Michigan.

In my judgment, this would depend entirely upon the location of the water pan and also upon the intensity of the heat maintained.

A. A. Clendenning, Keota, Iowa.

The capacity of the water pan should be from two and one-half to three gallons if located in front, and about five gallons if located on the top of the castings.

You may talk of Gettysburg's "Bloody Angle" or Waterloo's Sunken Road, but in every man's life there is no battle more severe, and no victory more honorable, than when he fights with himself and wins the victory. Victory over one's self is the greatest feat in the world! and surely he who cannot control himself cannot control other people.

Here Is a Piece of Ingenious Pipeless Furnace Work That Actually Delivers the Goods.

How Exceptional Difficulties Caused by Construction of Building Were Overcome.

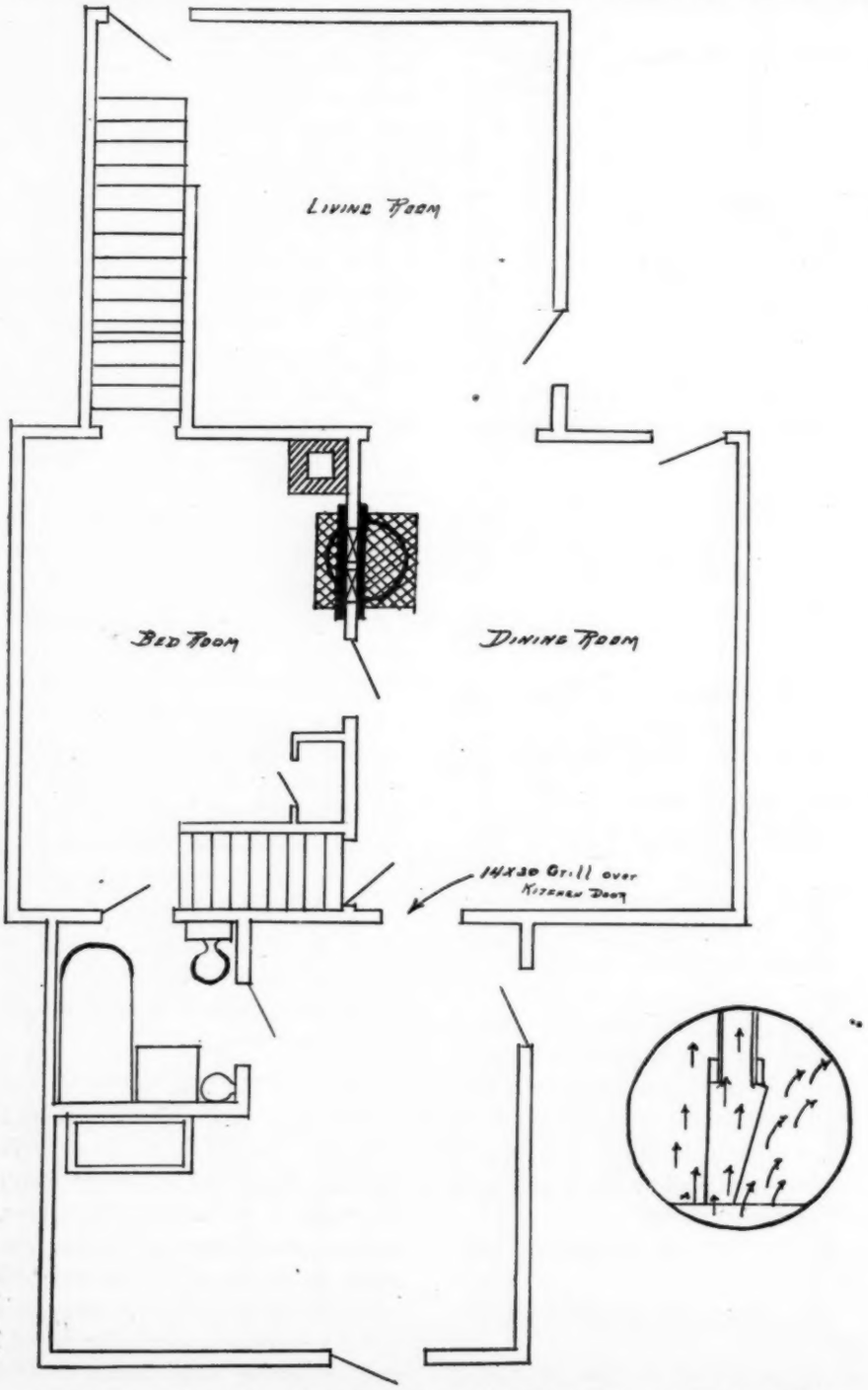
WHAT would you do if you had a proposition before you to put a pipeless furnace in a house with a basement less than six feet deep, with seven large rooms, seven outside doors, several rooms exposed on three sides—and make the furnace heat the house?

Well, here is how it was done by L. A. Stone, of the Engineering Department of the Waterman-Waterbury Company, Minneapolis:

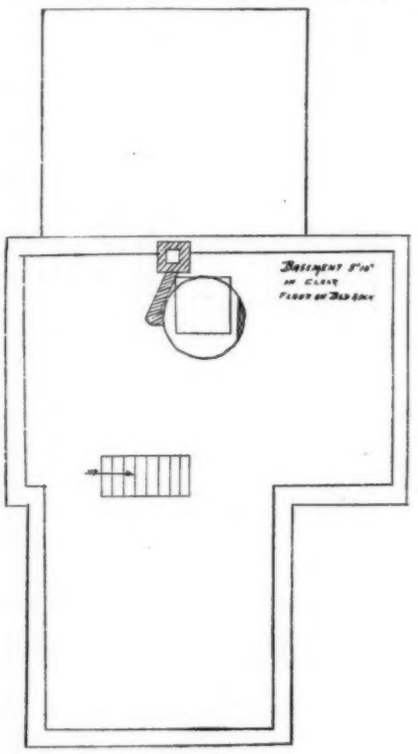
To AMERICAN ARTISAN:

Gentlemen: We were confronted this summer with the problem of heating an old-fashioned home with seven large rooms, most of which were exposed on three sides and with, altogether, seven outside doors. The basement extended only under the rear two-thirds of the house and was only five feet ten inches deep in the clear. The floor of the basement was on bed rock, so there was no way of lowering it without blasting. It was necessary to heat the house just as it was. And it wasn't a question of price. The owner wanted a *Clean* warm air system that could be guaranteed to heat his home thoroughly in every respect.

We felt that a satisfactory pipe job would be almost impossible under the circumstances, and an ordinary pipeless would not do, since he was particularly anxious to have all his bedrooms warm. So it was decided to install our Number 227 Waterbury Seamless Pipeless furnace under the wall between the dining room and the first floor bedroom, using our Waterbury Adjustable Wall Deflector above, and to install a 14x30 grill over the kitchen door. To get the heat to the second floor rooms, two 3x12 warm air stacks were run off the top of the deflector, one to a double register between two upstairs bedrooms and one to the center bedroom alone.



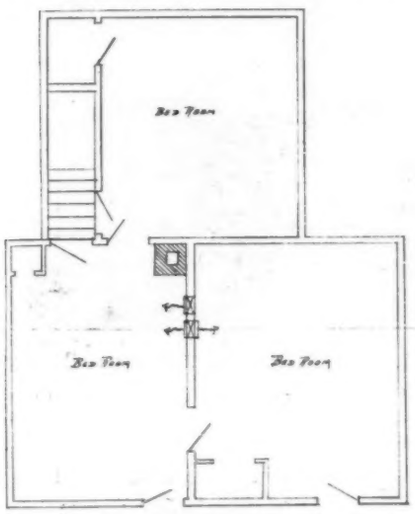
First Floor Plan: Also Showing Adjusted Wall Deflector in Circle at Right.



Basement Plan.

Our Adjustable Deflector is constructed in such a way that when the two center leaves, which form the deflector, are divided, the heat will come up in the center as well as on both sides.

But here another difficulty was encountered. Our ordinary pipeless furnace casing extends nine inches on either side of the register, and there wasn't nine inches allowable between the register and the chimney if the deflector was to stay in the wall, so instead of an ordinary pipeless furnace hood, our standardized offset hood was used. When



Second Floor Plan.

this is used, the casing is plumb with the register on one side and offset 18 inches on the other.

The job was installed on this layout for $365.50 on monthly payments. It has been in use for the past three months and the owner reports that the house is heated perfectly in every respect. He is even renting out one of the second floor rooms.

An error in an addition table brings an error in the sum total; correct that error and there is no harm done. An error in the calculation of a furnace installation is cumulative and its correction is not accomplished without considerable difficulty and expense. In making the calculation, be sure you are right and then go ahead.

Read every page in this issue.

Sedgwick Comes Out Squarely for Better Work and Fair Prices in Warm Air Furnace Installations.

Public's Opinion Is Based Upon the Low Priced Jobs Which Are Installed by Men Who Do Not Know or Care.

AMONG the younger men in the warm air furnace industry, F. G. Sedgwick, Vice-President of the Waterman-Waterbury Company, is becoming known as a man who usually has something worth while to say when he speaks, and the following article from him is right in line with the work which the National Warm Air Heating and Ventilating Association has undertaken:

It is my earnest opinion that the most important point for the furnace installer to give his attention to during the coming year is the education of the public on the advisability of installing furnaces in accordance with the National Code.

It seems incredible that an industry as old as the warm air furnace industry should grow to its present age and proportion with as little understanding of fundamentals of warm air heating as there is on the part of the manufacturer, jobber and installer of furnaces.

Hot water heating apparatus has long been installed on scientific principles, and this fact, coupled with the immense advertising propaganda of the interested manufacturers and jobbers, has in many instances created the impression that hot water heat is superior to warm air, when every reasonable argument and every fair comparison draws us inevitably to the conclusion that warm air heat is more efficient, more economical, quicker and more flexible than hot water can ever be.

If the manufacturers, the jobbers and the dealers of warm air heating apparatus can be made to appreciate during the year 1924 the one simple fact that the future of this industry lies in the proper installation of heating apparatus, a great step forward will have been taken.

The public's opinion of the proper price to pay for a warm air furnace installation is based upon the prices that are charged by the various dealers; and the prices charged by many dealers are based upon faulty installations, every one of which is a detriment to the industry as a whole.

I do not necessarily stand for the proposition that every installation shall be that of a high-priced furnace, with the highest quality of wall stack, registers and fittings, but I do believe that every installation should be made in accordance with the fundamental principles we know should obtain. And I further believe that if all installations are so made, the industry and public will both be greatly benefited.

If we continue in our present rut of cheap, inefficient installations, we are headed for a great slump in the industry as a whole as soon as prices on other forms of heating are readjusted, and warm air will be relegated to the position which it then has chosen for itself, which is that of cheap heating apparatus for the fellow who can not afford something better.

Furnace Installers Favor State Laws Controlling Installations Without Politics.

The opinion of the installers with regard to making of state laws controlling the installation of warm air furnaces seems to differ somewhat from the views on this subject held by the manufacturers. This was revealed by the questionnaire sent out to installers prior to issuing the Warm Air Furnace Special.

Seventy-seven per cent of those installers who answered the questions were in favor of such state laws, most of them making the additional reservation that these laws be enforced.

The remaining 23 per cent for the most part held the same opinion as did the manufacturers.

Triple Furnace Installation Gives Perfect Heat and Ventilation for Large Dormitory.

Two-story Building, 92 Feet Wide, with Two Wings, Each 50 x 32 Feet, Heated with Gravity Warm Air System.

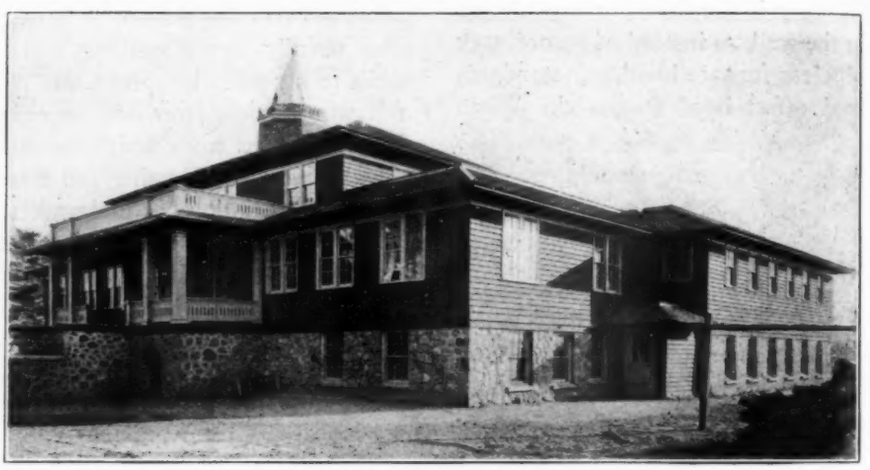
THERE was a time when some people thought that it was necessary to use steam or hot water to heat a large building, particularly if it was spread out, with wings and L's, but that time is past with men who know what properly installed warm air heating plants can do.

In the following is told the story of the warm air furnace installation in the Lutheran Mission for Indian children at Red Springs, near Shawano, Wisconsin, the details, illustrations and descriptions being furnished by W. R. Williams ("Carload Bill"), Oshkosh, Wisconsin, factory representative of the Thatcher Furnace Company for that state:

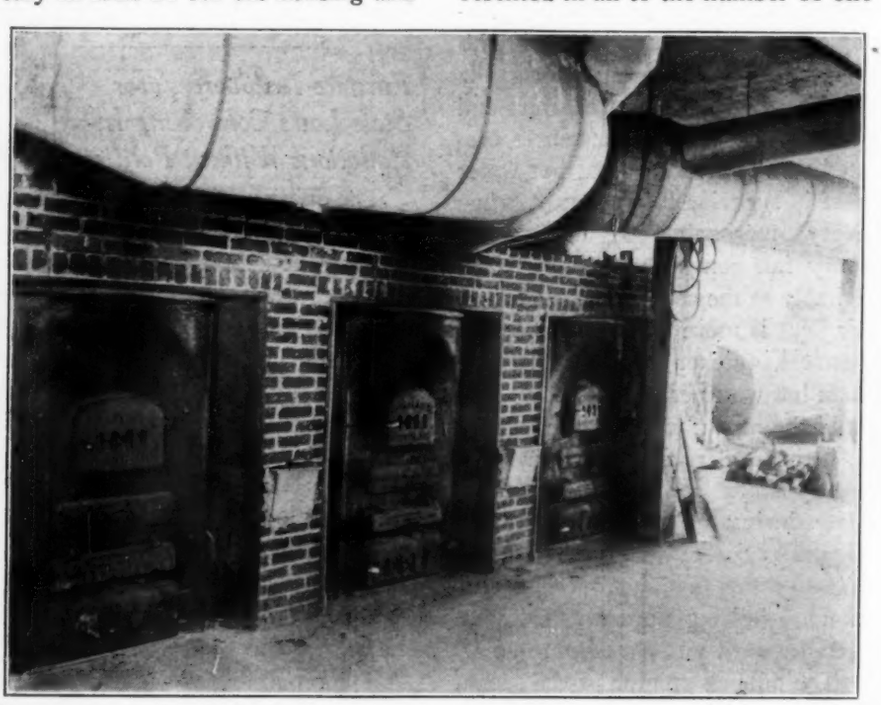
The accompanying photographs show portions of the new Dormitory built two years ago at Red Springs, Shawano County, Wisconsin, by the Missouri Synod of the Lutheran Indian Mission. This Mission was first organized in the year 1889. A church was built first; in 1900, a school; then this dormitory in 1920-21 for the housing and care of Indian children from various tribes in the vicinity of Red Springs.

There are a number of tribes located at several reservations represented at this dormitory; the Oneida tribe are of the greatest number with about 60 pupils; then come the Menominee tribe, the Chippewa, and Stockbridge tribes, represented in all to the number of one hundred and twenty-seven on the enrollment at this time, and they have very comfortable quarters at said dormitory which is kept in good order; neatness and cleanliness abound to a marked degree here.

The children range from about seven to sixteen years of age, and are well taken care of under the supervision of a superintendent, the Reverend O. W. C. Boettcher, who has full charge of this Mission, having an able body of assistants. There is a beautiful little lake directly in front of the dormitory where fishing and bathing are the principal sports in summer and ice skating in winter months.



Dormitory of Lutheran Mission for Indians, Red Springs, Shawano County, Wisconsin.



Front View of Triple Setting of Thatcher Tubular Furnaces in Lutheran Mission Dormitory.

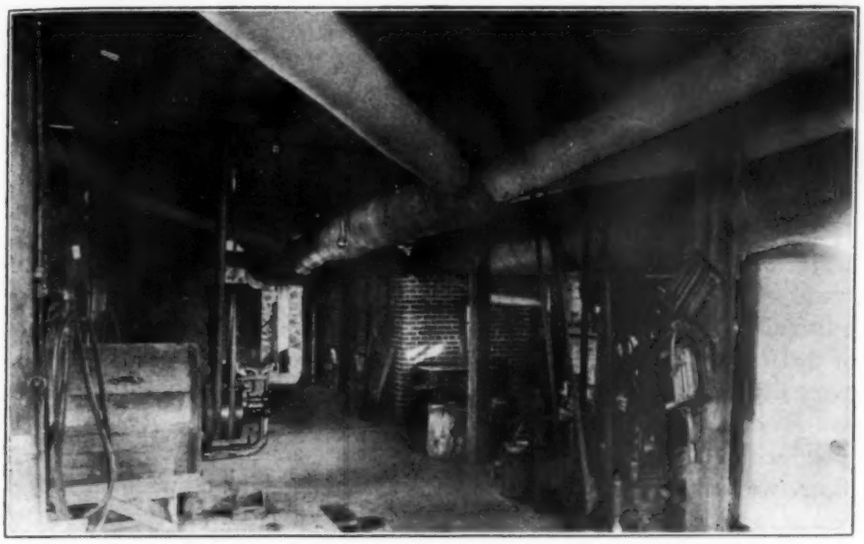
This dormitory is being successfully heated throughout every room by a Gravity Warm Air System consisting of three 30-inch Number 62 Tubular all cast iron furnaces, manufactured by the Thatcher Furnace Company, Newark, New Jersey, and Chicago. They are placed as shown in the accompanying illustration, in battery brickset form.

Three large 36-inch trunk lines leading from the top of the brickset chambers directly over each furnace. The furnace at the right supplies the heat for the girls' gymnasium, and the girls' sleeping apartments above.

The furnace at the left end furnishes the wairm air to the boys' gymnasium and their sleeping apartments above.

In each of these sleeping apartments there are about sixty white

enameled single beds, as shown in the picture. At one end of this room is a wardrobe in three partitions; to the left of these wardrobes are the two bath rooms, lavatory and toilet; all a part of each of the two separate sleeping apartments.



View Showing Trunk Lines of Warm Air Pipes Leading from Brick Encased Triple Setting of Furnaces.

The center furnace is used to heat all other parts of the building; dining room, front entrance, reception room, sewing room, sick room, matron's room, matron's sitting room, also matron's and cooks' bed room; all on the main floor, while on the upper floor are the library in center, with two living rooms and bed rooms for the teachers at the school.

This building has all the modern conveniences as well as a first class heating apparatus—hot and cold running water, the pressure supplied through air and water tanks by a gasoline engine in basement.

The main floor is 92 feet across the front, extending back 32½ feet, where the gymnasiums start and extend back from each end of front, 50 feet long each by 32 feet in width. The upper floor is 50 feet long by 24 feet deep. Over this there is a tower projecting upward from the center of this top floor. You will note the canvas Indian wigwam which forms the roof over the tower, in order to designate from a distance that this is an Indian dormitory.

The superintendent states that the heating system is giving an abundance of heat in the coldest winter months, and this with no storm windows or storm doors. However, they are thinking seriously of saving a part of the expense for wood by adding storm windows and doors from time to time.

From the writer's observation it appears that everybody from the youngest child to the superintendent are one healthy, happy looking bunch indeed and looking forward patiently for the year 1924 to arrive, as they are anticipating holding their twenty-fifth anniversary of the founding of this mission, and they expect to hold a Grand Jubilee some time during next summer.

The heating and ventilating of this dormitory was awarded to Sell Brothers Hardware Company, Wausau, Wisconsin; Hugo Sell was in charge of the installation with a crew of able furnace mechanics.

They were the highest bidders for the job, three others submitting bids, which shows that the trustees were seeking the best.

An important feature in the heating of this large building is the fact that the heat is distributed by gravity only. No fan nor other means are provided enough though they have their own electric lighting system. Nearly 200,000 cubic feet of space is heated in this building.

What Customers Can't See They Seldom Ask for.

To say that you must display goods before people will buy them is almost as trite as to say that you must turn on the faucet before water will flow from it, yet there are merchants, so-called, who overlook this fact day after day. They have the merchandise in stock, but only they and the man who sold it to them are aware of the fact.

Section of the Boys' Sleeping Quarters, Heated and Ventilated with Warm Air.

Attractively displayed goods are half sold.

Every page in this issue is worthy of your careful study.

R. W. Menk Describes What He Terms an Ideal Warm Air Furnace Installation.

Maintains That Installers Who Do Good Work Only Are Also Those Who Make Money.

THE article herewith is more than a description of a warm air furnace installation: It is in itself an argument for the idea which is fast becoming recognized as the only basis upon which the warm air furnace industry can hope to attain real success—that good installations of reliable furnaces not only will please the house owners but will pay good profits to the installers.

The following is contributed by R. W. Menk, of the Excelsior Steel Furnace Company, Chicago:

In the past two years we have tried to contribute something of an unusual nature rather than a layout of the every day installation. In this instance we are pleased to supply a plan and layout covering a neatly designed home, such as is being constructed throughout the country in large numbers. This plan affords, in our estimation, one of the ideal layouts and is typical of the home the average American wants to own.

Building constructions of this character are being heated in thousands of instances by other than warm air, which from the viewpoint of the furnace man is a gross error, especially where the floor designs and basement arrangements correspond with the plan submitted. The plans, we believe, contain sufficient details to permit the reader to grasp the general arrangements.

Three features to be noted especially are the location of the return air faces, return air ducts under basement floor, and warm air supply.

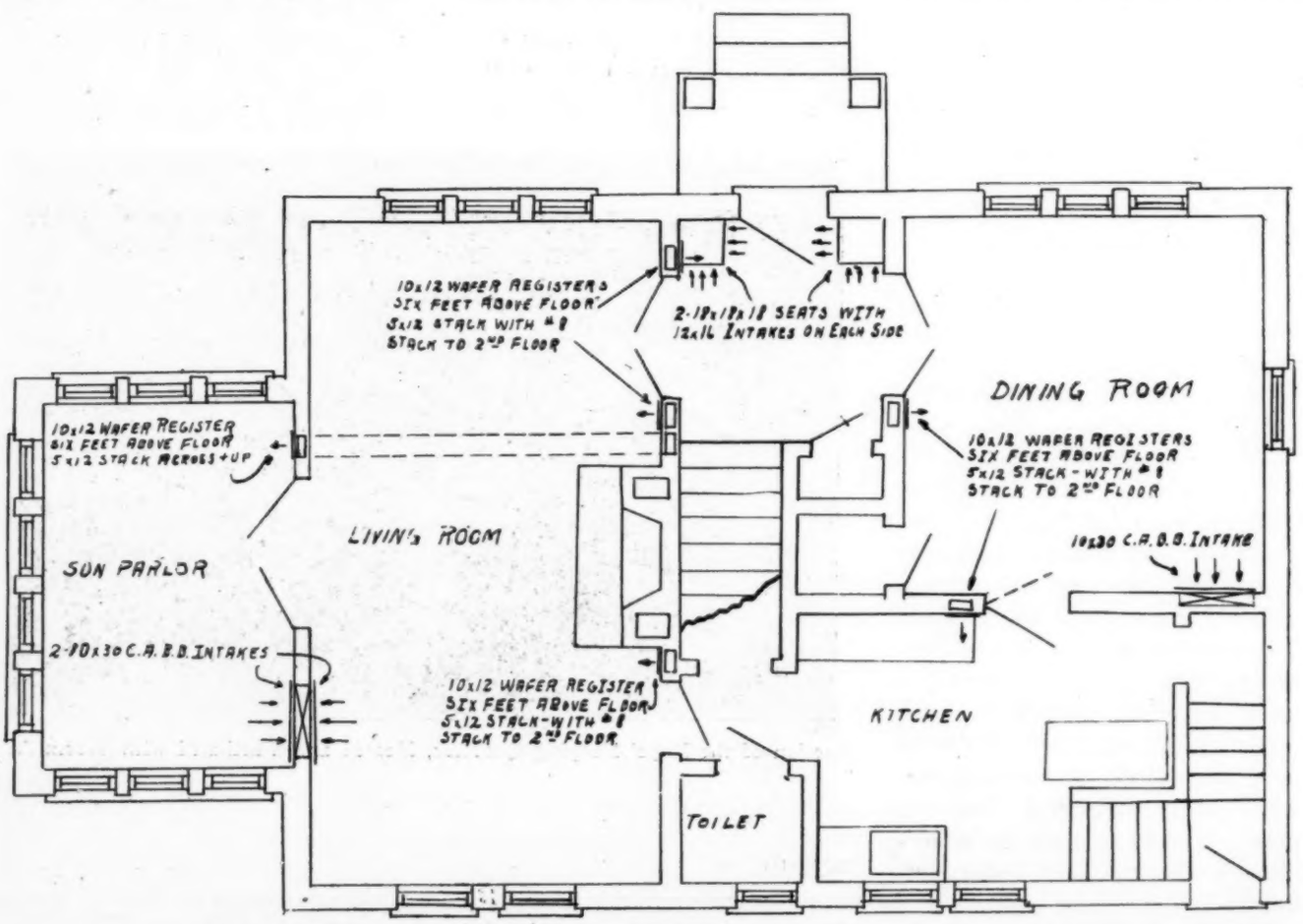
It will be noted that air is recirculated from three points affording splendid circulation, although we would have preferred to have placed the return air face in the sun parlor, in the west wall.

The air is returned through base board intakes of H. & C., class 655, except the intakes in the hall, which are standard oak faces covered with oak tops offering a unique arrangement.

The return air ducts under the basement floor are smoothly cemented and provision is made to thoroughly flush them, thereby affording sanitation and added humidity, as well as avoiding the destruction of the headroom in basement.

The other special feature is the warm air supply arrangement. Please note that all warm air leaders are taken from the top of the furnace bonnet and that the leader for the sun parlor is taken from the center of same. An 8 inch by 12 inch duct is carried under living room between the joists.

All warm air leaders are connected to 5 inch by 12 inch Excel-


10x12 WAFER REGISTERS SIX FEET ABOVE FLOOR 5x12 STACK WITH #8 STACK TO 2ND FLOOR
2-18x18x18 SEATS WITH 12x16 INTAKES ON EACH SIDE
DINING ROOM
10x12 WAFER REGISTERS SIX FEET ABOVE FLOOR 5x12 STACK - WITH #8 STACK TO 2ND FLOOR
10x12 WAFER REGISTER SIX FEET ABOVE FLOOR 5x12 STACK ACROSS + UP
LIVING ROOM
SUN PARLOR
10x30 C.A.B.B. INTAKE
2-10x30 C.A.B.B. INTAKES
10x12 WAFER REGISTER SIX FEET ABOVE FLOOR 5x12 STACK-WITH #8 STACK TO 2ND FLOOR
KITCHEN
TOILET

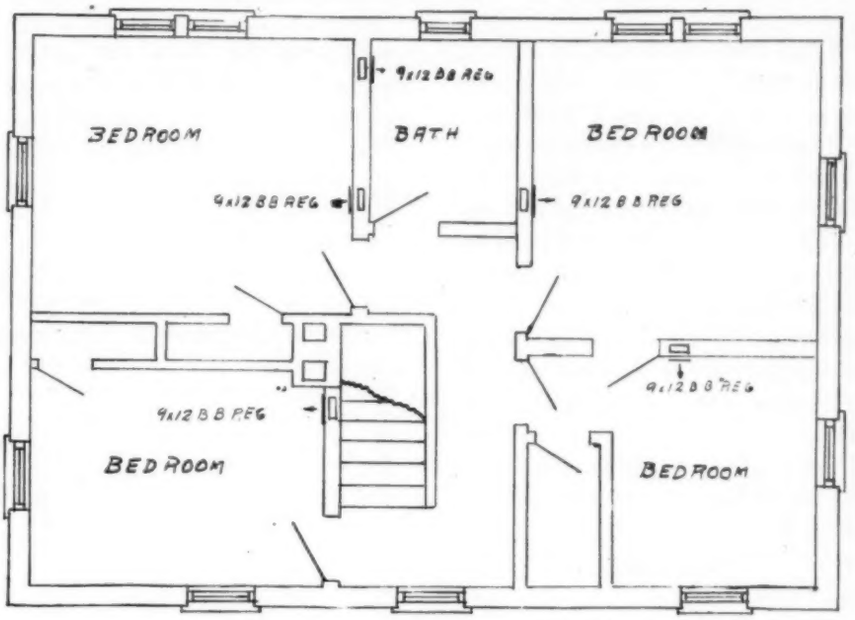
Plan for First Floor Showing Location of Registers, etc., in Excelsior Furnace Installation.

sior double wall stacks and outlets for supplying warm air to the first floor rooms are taken off 6 feet above the floor; outlets on second floor are at base board. The warm air registers used on first floor are H. & C. class 350 and class 131¼ on second floor.

The object of presenting a layout of this character is two-fold. First, there are numerous features that warrant consideration by the furnace installer, and second, the installation should be brought to the attention of home owners, architects and contractors.

The day has arrived when boosting instead of knocking is beginning to dominate. The influence of the better furnace work done throughout the country during the past few years is beginning to make itself felt. The efforts put forth by installers of high class warm air heating systems are having their effect not only upon the public, but upon the installers who in the past have cared little what the results would be. Sales seemed to be their uppermost endeavor. The greater percentage of installers who have made money in the furnace business are those who have adhered to good installations.

What furnace salesman could not impress the prospective home owner that the accompanying plan and layout would give splendid results and satisfaction and that he would have a system he would be proud to show his friends and to boast about? Who, as a furnace salesman cannot convince the buyer that double wall stacks and base board registers are the proper conductors of warm air, and so on throughout the job.

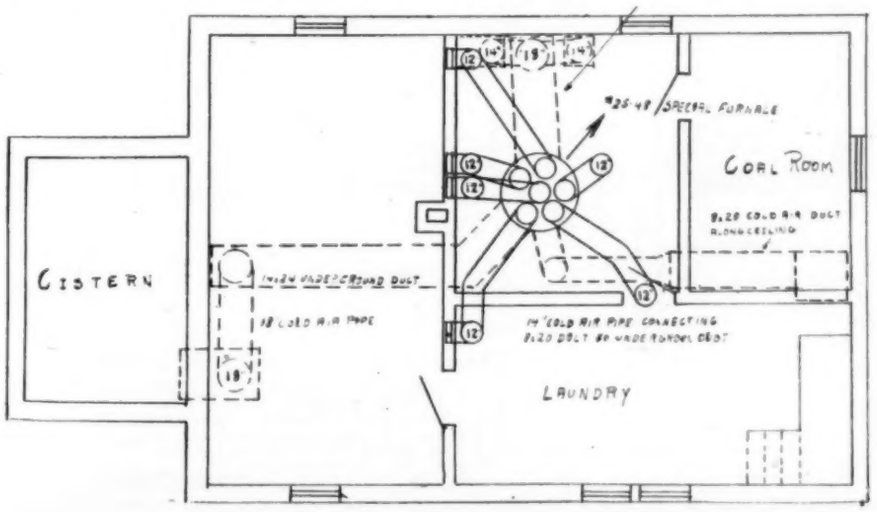


Second Floor Plan.

Warm air furnace salesmen, whether they be manufacturers' representatives, or salesmen and installers are talking Warm Air Heating Systems today and backing them up by installations worthy of their name.

The fellow who is out after business makes the best possible start by doing first class work. He sets a fair price on such work and insists on getting that price. He gets the price and the work because he tells his story and backs it up with a layout and a reputation for quality at right prices, thereby naturally gaining the favor of the owners and of the community in which he works.

The primary object of this layout is to continue to point the way toward the ideal Warm Air Heating System and to extend the services of our Engineering Department to readers of AMERICAN ARTISAN.



Basement Plan for Excelsior Furnace Installation.

Proper Humidity Makes It Possible to Reduce Temperature Considerably.

In 1919 the Health Department of Chicago made an investigation of the methods of fuel saving and found that if moisture was introduced into the air of dwellings, a reduction in the amount of coal used could be made with safety and comfort. The heating engineer stated that the heat loss from a building depended essentially upon the difference in temperature outdoors as compared with indoors; great differences giving greater heat loss and small differences, less. It can easily be shown that a saving of from 10 to 15 per cent can be made in the coal bill, if an indoor temperature is kept at 68 degrees during the heating season with a corresponding increase in humidity.

Read every page in this issue.

It Is a Case of Keeping Continually at It to Build a Successful Furnace Business.

Follow-up Letters, Personal Calls, Booklets, Demonstrations of Furnace and Showing of Other Installations Help Make Sales.

IN Mansfield, Ohio, there is a warm air furnace installing firm by the name of G. C. Aungst & Brother.

They located a prospect by name of A. S. Roberts, 130 East Main Street, last spring and notified the Globe Stove and Range Company, Kokomo, Indiana, the advertising department of which at once got on the job, with the result that a sale was made and a furnace installed according to the plans shown herewith.

As a matter of interest, we publish in the following the three letters which helped to clinch the sale:

First Letter.

MR. A. S. ROBERTS,
130 East Main St.,
Mansfield, Ohio.

Dear Mr. Roberts:

What could bring more real comfort and enjoyment to your household than a dependable heating system?

It would protect you and your family from winter discomforts and exposure. It would increase the actual value of your property more than the cost. How, then, can you afford to be without it?

There is no part of the home of greater importance than the heating plant. Surely it is well worth your while to see that the furnace you install is absolutely *right*—a furnace that you can depend upon to give you perfect heating service through the years.

For many years this company has been building heating equipment recognized for its unusual qualities. The furnace that we are building—the furnace that we would build for you—is known the country over for its heating efficiency—its cleanliness—ease of operation and its economy.

The Globe is so built that it generates all available heat from the fuel and delivers it to the rooms—not out the chimney. Have you noticed in the enclosed descriptive folder how the Globe fire pot is built? It costs a few dollars more to build furnaces this way—but say,—the actual fuel saving pays that back, many, many times over.

You can get complete information from our representative. We coöperate in giving you the best heating system that money can buy. See the Globe and convince yourself.

The Globe Stove and Range Company.

WILLIAM A. COOPER.

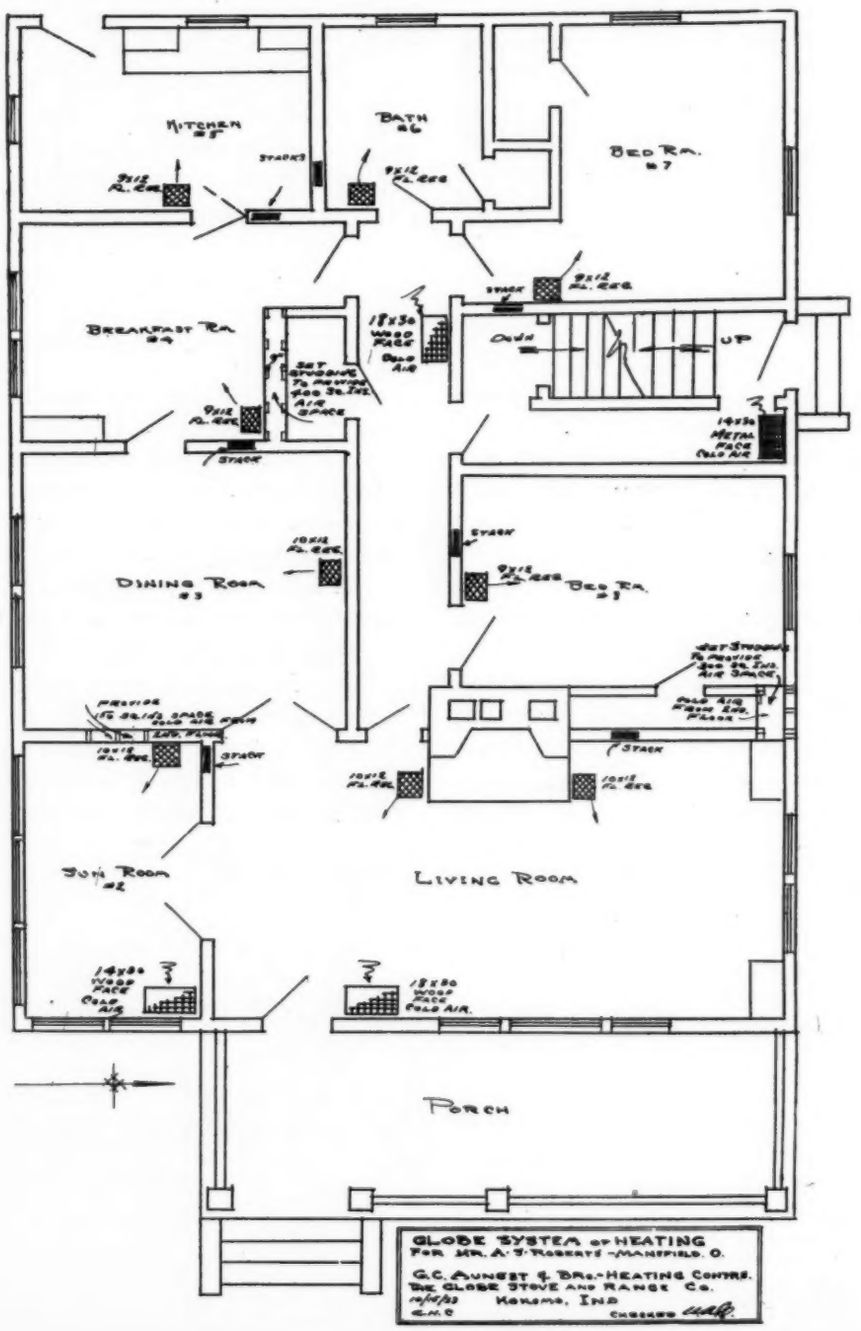
Sold and installed by G. C. Aungst & Brother.

Second Letter.

Mr. A. S. ROBERTS,
130 East Main St.,
Mansfield, Ohio.

Dear Mr. Roberts:

Did you talk to our representative



First Floor Plan for Twin Setting of Globe Warm Air Furnaces in Duplex Family Apartment.

about the Globe? Did you notice how the fire pot is built?

The Globe "two-piece — full slotted" fire pot is the most efficient fuel burning construction known. Recent tests made by heating engineers have proved that it generates at least 9 per cent more heat from the fuel. 9 per cent of the fuel cost is worth saving, isn't it?

But, the Globe fire pot saves more than that. It burns the soot—converts it into heat. There is no soot deposited inside the Globe to interfere with heat radiation. The Globe fire pot will save many dollars for you every winter.

And did you examine the shaking device? No stooping—no straining—no dust with the Globe. Just a slight movement of the shaker handle clears the grate of ashes. And if a clinker should form on the grate it can be removed in a few seconds without opening the feed door or disturbing the fire. A wonderful improvement that means convenience for the owner of a Globe.

These are just two of the many features that we have built into the Globe to make it the most efficient—the most economical and the most easily operated furnace. Anyone can take care of it. The backbreaking drudgery is gone.

Your Globe System will be built especially for your home. When you buy a Globe you are investing in permanent heating service—an investment that pays dividends in Health, Comfort and Economy. Now is the time to arrange for a Globe installation.

Yours for healthful heat,
The Glove Stove and Range Company.

WILLIAM A. COOPER.

Sold and installed by G. C. Aungst & Brother.

Third Letter.

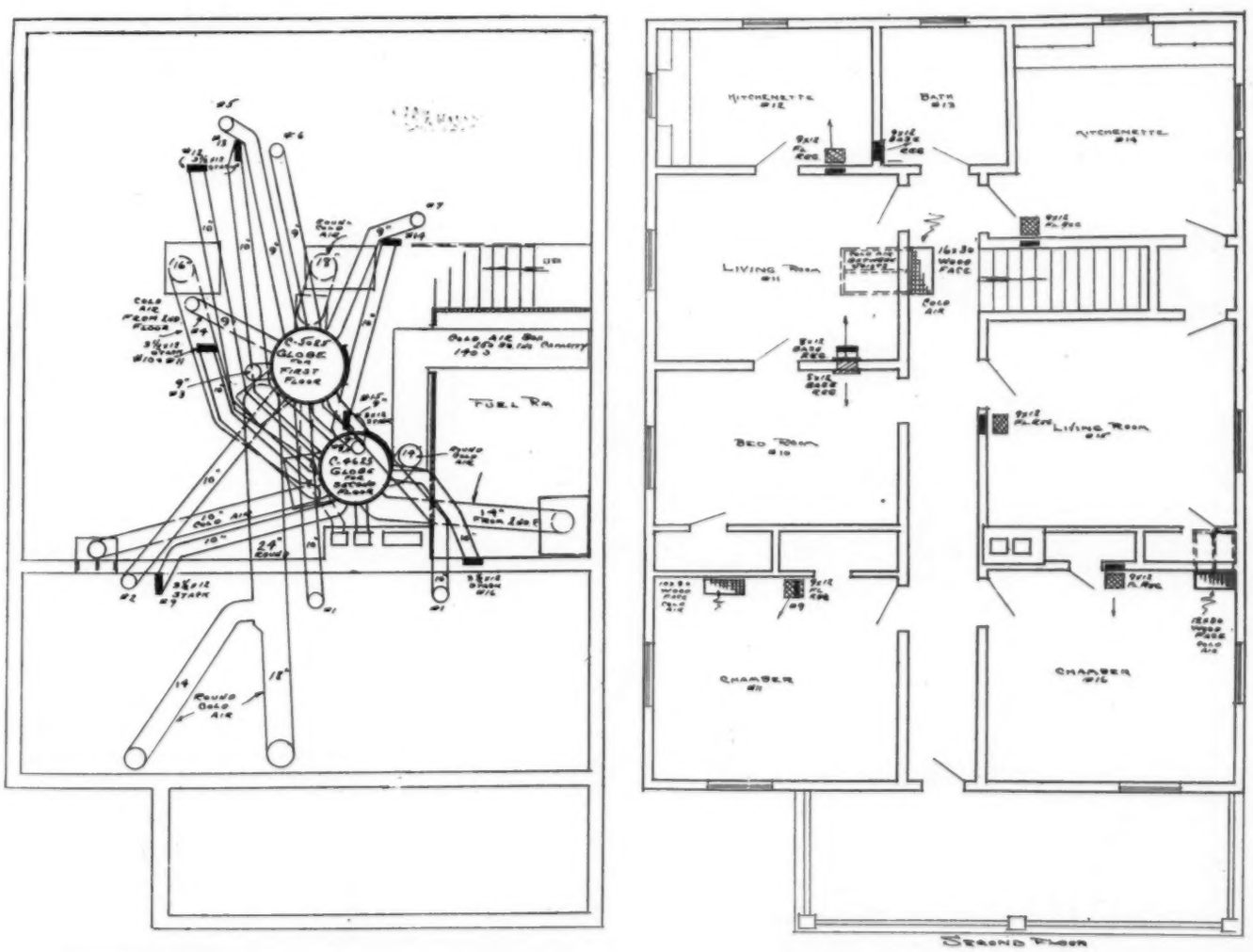
MR. A. S. ROBERTS,
130 East Main St.,
Mansfield, Ohio.

Dear Mr. Roberts:

You are invited to visit our factory and see Globe furnaces in the making.

It would be of great interest to see, for yourself, just how Globes are built—how Globe dependability is built into them for your protection.

We would like to have you right on the job when our metallurgists weigh out and load the new pig iron into the cupolas. It would be mighty interesting to see how carefully the molds are made of fine sand, the liquid metal poured, the castings cleaned, machined, fitted and finally assembled into complete furnaces,



Basement and Second Floor Plans for Twin Setting of Globe Warm Air Furnaces in Duplex Family Apartment.

ready for the inspector and shipment.

You would thereafter have absolute faith in the Globe. You would then know for yourself that we are building furnaces honestly—using every possible means to build for you the very best furnace that skilled craftsmen, improved machinery and highest grade materials can produce.

You would then know that the Globe is so built that it will continue to give you economical, trouble-proof heating service through the years. It is built for year in and year out satisfaction—for you.

Why not arrange today with our representative for your Globe Heating System—a heating system that is worthy of your trust.

Yours for lasting satisfaction,
The Globe Stove and Range Company.

WILLIAM A. COOPER.

Sold and installed by G. C. Aungst & Brother.

Every page in this issue is worthy of your careful study.

Warm Air Furnace Installation for Typical Two-Family, Five-Room Flat Building.

W. Gunton States That Return Ducts, Warm Air Pipes and Register Sizes Were Figured According to Standard Code.

THE following article describes a warm air furnace installation in a typical five-room, two-flat building, provision being made for returning the cold air from the upper floor in the same proportion as that from the lower floor.

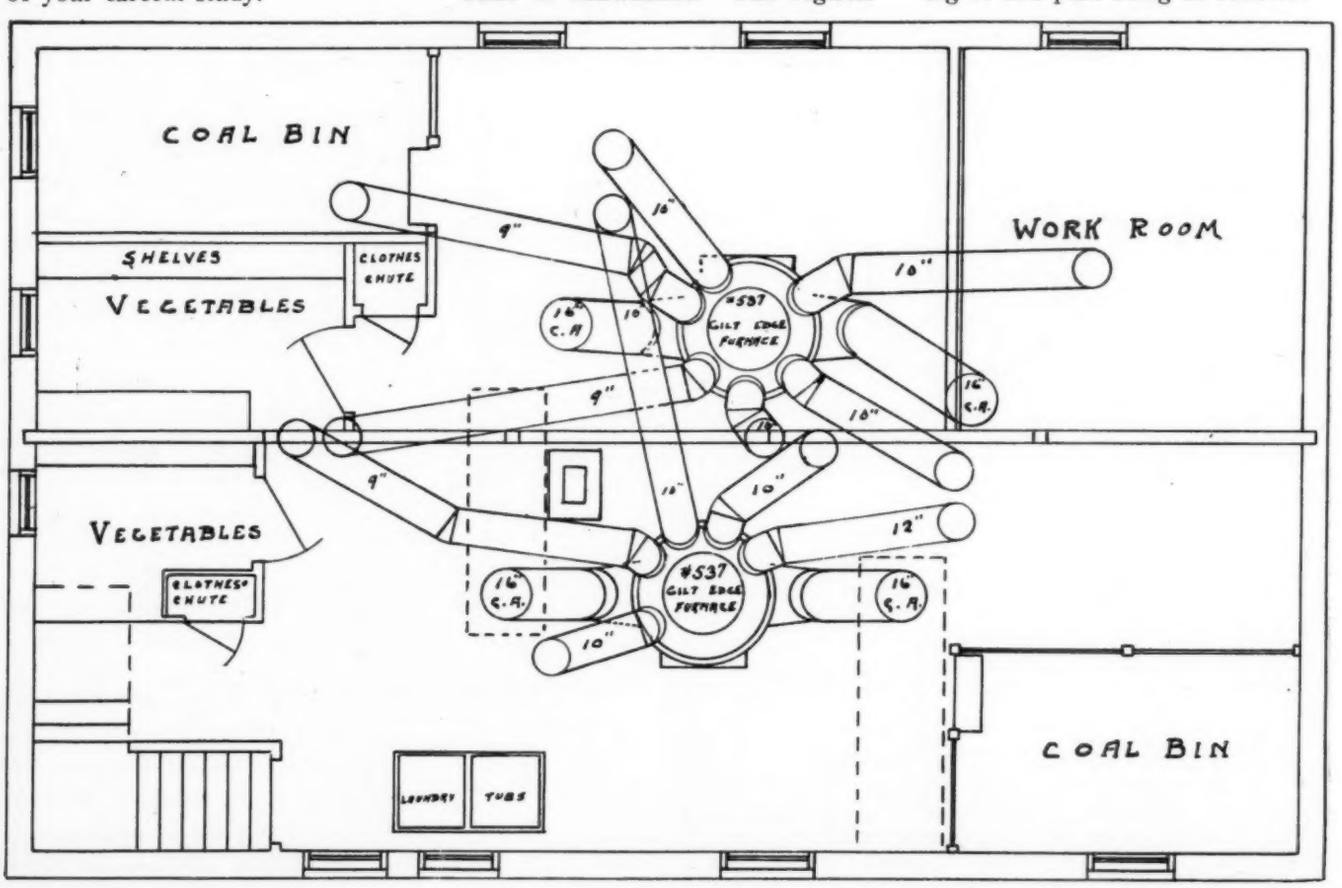
W. Gunton, of the Engineering Department of R. J. Schwab & Sons Company, Milwaukee, Wisconsin, who supervised the drawing of the plans and the description of same, states that in this installation the furnace pipe and register sizes were figured according to the rules outlined in the Standard Code adopted by the National Warm Air Heating and Ventilating Association.

The description follows:

This building is a typical five room and bath, two family flat building, such as is built on a large scale in Milwaukee. The register openings, stacks and pipe sizes are figured according to the National Code. The cold air is returned from the second floor flat as well as from the first and is approximately equal in area to the warm air pipes.

The cold air from the second floor is returned to the basement through two 6x30 metal ducts dropped down through the studding; six inch studding being used when these ducts are placed.

The area of the warm air pipes are 420 square inches for one floor and 418 square inches for the other. The cold air supply pipes have an area of 406 square inches each. The furnaces used are two No. 537 Gilt Edge, having a rating in leader pipe area of 575 square inches. The material with price of same necessary to make the installation according to this plan being as follows:

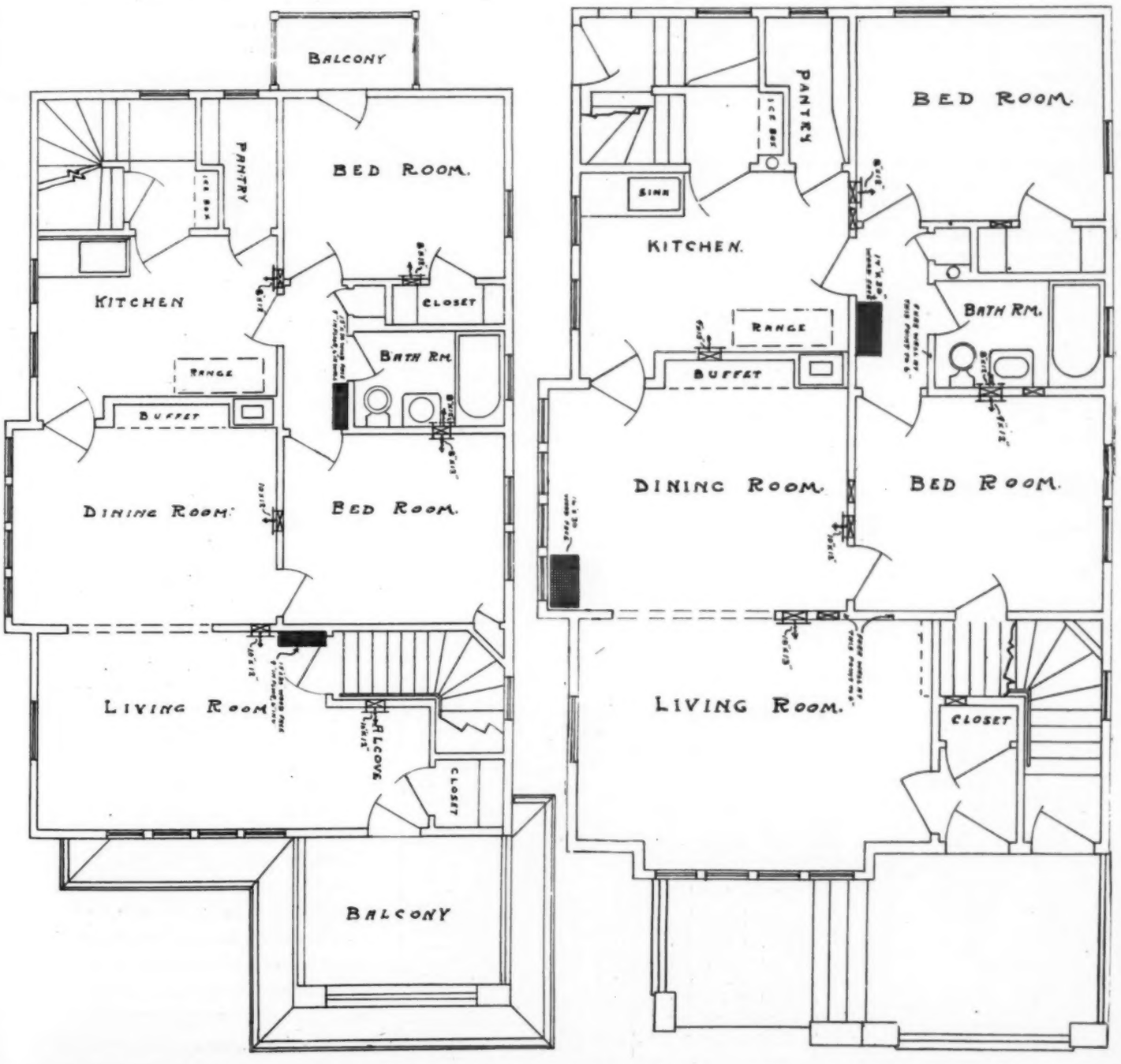


Basement Plan Showing Installation of Twin Furnace Plant, Furnished by R. J. Schwab & Sons Company, Milwaukee, Wisconsin.

Cost Prices of Items for Installation.

2—No. 537 Gilt Edge Furnaces.....				219.46
2—No. 537 Casings				29.00
4—14x30 Wood Faces	2.92	11.68	50% off	5.84
2— 9x12 N. P. Reg.....	4.90	9.80		
5— 9x12 B. B. Reg.....	4.90	24.50		
4—10x12 B. B. Reg.....	6.00	24.00		
1—10x13 B. B. Reg.....	8.25	8.25		
1—No. 2Hd. No. 8 Stack 9x12.....	1.76	1.76		
2—No. 1 Hd. No. 8 Stack 9x12.....	1.76	3.52		
3—No. 1 Hd. No. 8 Stack 10x12.....	1.76	5.28		
2—No. 13 Ells No. 8 Stack.....	1.40	2.80		
4—No. 8 Boots No. 8 Stack 10-in. Collar	1.76	7.04		
2—No. 8 Boots No. 8 Stack 9-in. Collar	1.76	3.52		
1—No. 2 Hd. 9x12	2.60	2.60		
1—No. 8 Boot No. 2 Hd. 9x12 10-in. Collar	2.60	2.60		
1—No. 1 Hd. 9x12	2.38	2.38		
1—No. 8 Boot 9x12 9-in. Collar	2.38	2.38		
2—No. 1 Hd. 10x12	2.38	4.76		
2—No. 8 Boots 10x12 10-in. Collar...	2.38	4.76		
1—No. 1 Hd. 10x13-B	3.30	3.30		
1—No. 8 Boot 10x13-B 12-in. Collar.	3.30	3.30		
18-ft.—6-in.x30-in. Metal Duct	1.20	21.60		
2—No. 5 Shoes with 16-in. Collar....	3.60	7.20		
3—9-in. Pitch Casing Collars	.46	1.38		
3—9-in. Dampers	.43	1.29		

6—9-in. Ells	.50	3.00	
34-ft.—9-in. Tin Pipe	.35	11.90	
6—10-in. Pitch Casing Collars	.50	3.00	
6—10-in. Dampers	.46	2.76	
12—10-in. Tin Ells	.60	7.20	
36-ft.—10-in. Tin Pipe	.39	14.04	
1—12-in. Pitch Casing Collar	.60	.60	
1—12-in. Damper	.60	.60	
2—12-in. Tin Ells	1.00	2.00	
8-ft.—12-in. Tin Pipe	.45	3.60	
4—No. 201 16-in. Cold Air Shoes	5.60	22.40	
2—16-in. 60 Degree Galv. Angles...	1.60	3.20	
4—16-in. Top Collars	.60	2.40	
30-ft.—16-in. Galv. C. A. Pipe.....	.80	24.00	
4—9-in. Smoke Ells	.44	1.76	
10-ft.—9-in. Smoke Pipe	.80	8.00	
Total		258.48	
Less 33⅓%		85.16	
			172.32
50 lbs. Asbestos Paper			3.00
10 lbs. Paste			1.20
3 Sheets Galvanized Iron No. 28— 32x96			3.75
Grand Total			$434.57



Floor Plans for Two Family Apartment Building, Showing Locations of Cold and Warm Air Registers and Wall Stacks.

Furnace Installers Should Use Standardized Blanks for Floor Charts and Necessary Data.

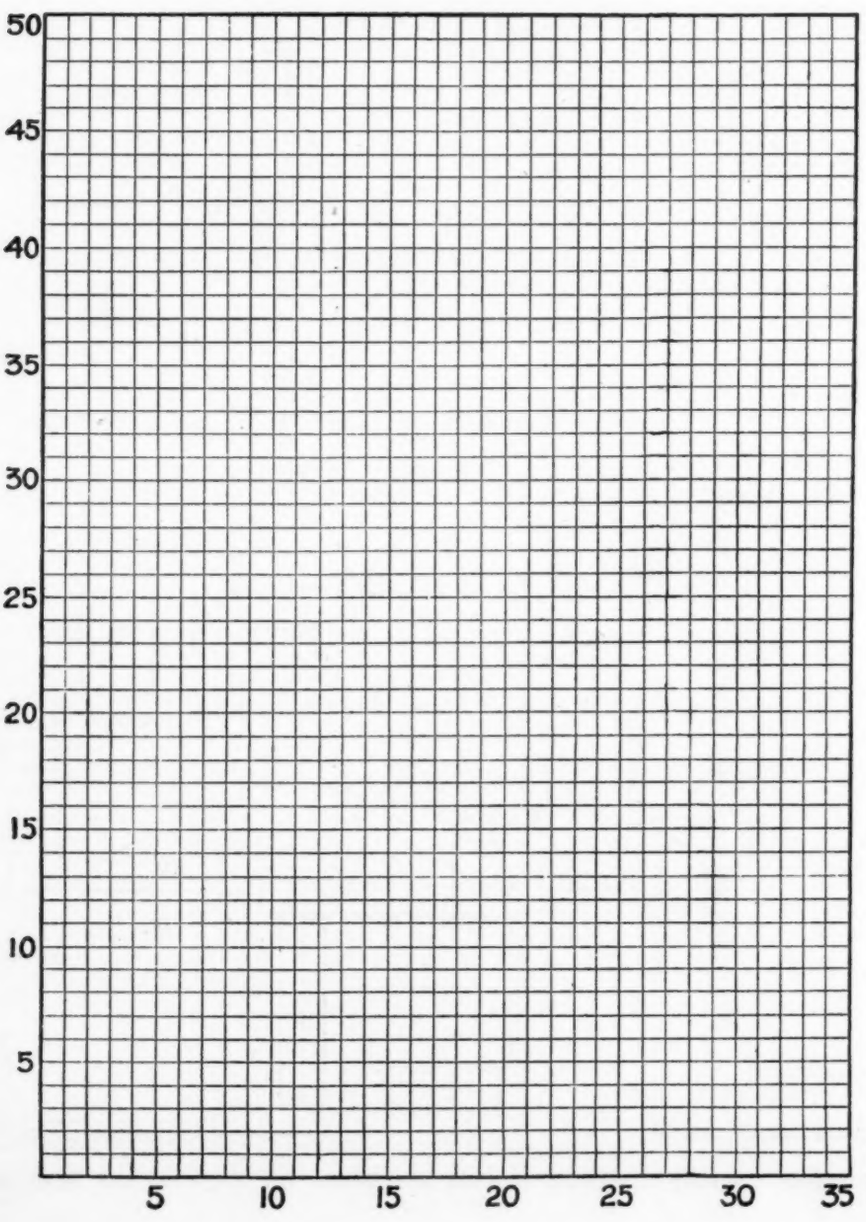
Many Expensive Errors Are Made Because of Faulty Notations Made on Scraps of Paper.

EVERY warm air furnace installer should have a supply of ruled blanks as shown here, with information sheets containing the same or similar questions as the following which are quoted from a pamphlet sent out by the Waterman-Waterbury Company:

Directions—Read Carefully.

Each square below represents one square foot. With pencil, show shape and size of each room, make no allowance for thickness of partition, as we will understand that. Mark inside dimensions of rooms, location of partitions, windows, outside and inside doors. Be sure to locate halls and closets, even if these are not to be heated. Show which way stairs lead, locate chimney, show location of fireplace or anything that would interfere with the placing of register. Mark doors that have transoms with a "T." Mark place where you would like register placed, thus ☐

Each Square Represents One Square Foot



Name of House Owner.....
City .....
County .....
From .....
(Name of Dealer)
City ..... State.....
Is the house alone or in a block?...
What direction does the building front?.....
Is on elevated ground?.....
On which side, if any, is it protected from wind?.....
State exact *outside* dimensions of building.....
How many stores has the building?.....
State size of inside of furnace chimney.....
Is any stove or grate to be connected to this flue?.....
Does the furnace flue extend to the cellar?.....
Give height and width of doors....
Is stairs leading to second floor open or enclosed?.....
Does cellar extend under entire building?.....
Will you burn hard coal, soft coal, coke or wood?.....

If Church, Theatre or Public Hall, answer the following in addition to the above:

Give size of room.....
Give style of ceiling, whether flat or arched .....
If flat, give height of side wall....
If arched, give height of side wall and at center.....
Are floors level or lower at pulpit or platform?.....
Does gallery, if any, project over auditorium?.....
Give location of tower.....

Show on your sketch the arrangement of seats and the location of aisles.

Mark rooms which you have found to be the coldest or hardest to heat with an ☒.

Make separate diagram for each floor, noting size of each room, height of ceiling for each floor.

Number all doors shown in your sketch and give height of each in this space:

It's a wise man who knows where to draw the line between economy and stinginess.

Manufacturers Unanimous in Distributing Dealer Sales Helps Among Their Agents.

Installers Also Shown How to Use Sales-Helps Most Effectively in Many Instances.

ONE subject which perhaps engages the attention of the installer to a considerable degree is the question of how to properly and intelligently use the dealer sales helps with which the manufacturer supplies him.

There are perhaps many instances where the dealer help has been partially and even totally lost for want of proper instructions on how to use these helps most effectively.

A Houseful of Cleanheat at Little Cost
A Heating System Designed for Economical Trouble-Proof Service
Three Pipe System Furnace
The GLOBE THREE PIPE SYSTEM
For Residences, Churches, Halls, Store Rooms, Offices, etc.
SPECIFICATIONS
The Globe Stove & Range Co.
Kokomo, Indiana
Why the Globe Three Pipe System Is Superior—
The Famous Globe Slotted Fire Pot and Anti-Clinker Grate
Superior in Design Workmanship and Material

Pages from Booklet of Globe Stove & Range Company, Kokomo, Indiana.

Below are given the results obtained from a questionnaire sent out to manufacturers by AMERICAN ARTISAN, asking the following questions:

"What do you furnish in the matter of advertising helps for the dealers?"

"How can the dealer most effectively use your advertising helps?"

One manufacturer in Missouri answers:

1. Signs, posters, electros, newspaper cuts, movie slides, blueprints, memo books, pencils.

2. By having the determination to get more business and to become a success in his business.

Another manufacturer says:

1. Circulars, cuts, plans and estimates, advertising service and copy.

2. Just by using them along a definite plan and goal worked out with our representative and advertising manager.

A Wisconsin manufacturer answers:

1. Catalogs, circulars, blotters, slides, electros, etc.

2. Unless the merchant has merchandising ability and initiative, by allowing us to direct his efforts.

A manufacturer in Ohio has this to say:

1. About twenty-five different items in addition to national and local newspaper advertising.

2. By distributing same and by putting forth selling effort.

Brillion Iron Works, Brillion, Wisconsin:

1. Literature—signs, etc.

2. Mailing to customers.

The Waterman-Waterbury Company, Minneapolis, Minnesota.

1. Electrotypes of ads, movie slides, catalogs, envelope stuffers, a follow-up series of letters to all prospects referred to us, a guarantee of each job O. K.'d by our office, window transfer signs, house signs for use where furnaces are being installed, attractive hangers or posters for dealer's store, a carefully laid out course of advertising in farm papers, architectural journals, local newspapers, etc.

2. The dealers who do effectively use our advertising helps are comparatively few. The dealer who most effectively use these helps uses them in an effort to couple his advertising with our regular advertising.

A Michigan manufacturer sends in this answer:

1. Catalogs, circulars, house signs, movie slides, electrotypes, complete merchandise follow-up.

2. By following the advice of our merchandise department.

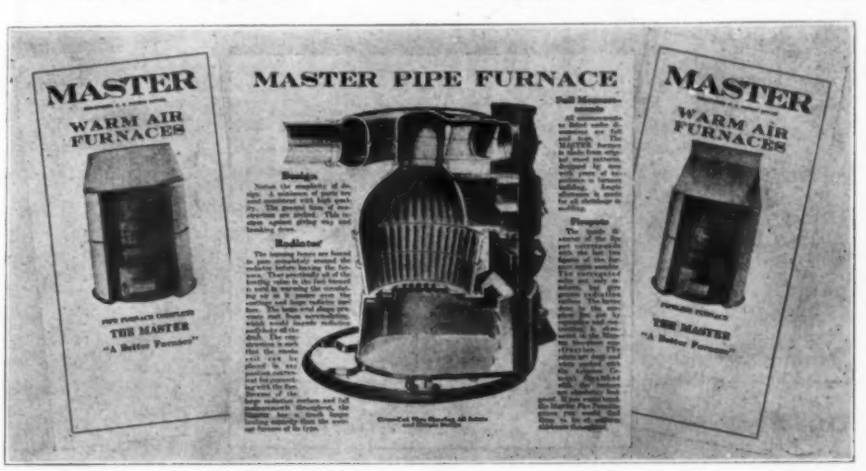
Quick Furnace and Supply Company, Des Moines, Iowa.

1. Catalogs, circulars, electros, copy for newspapers, prospect letters.

2. Send in prospect names—use daily papers.

An Ohio Manufacturer:

1. We furnish catalog illustrating and describing our complete line; we also furnish electros of ready made advertisements for local newspaper advertising, and we as-



Pages from Booklet Furnished to Installers by Mt. Vernon Furnace Company, Mt. Vernon, Illinois.

sist the dealer in that local advertising, allowing him a percentage of his purchases.

A Pennsylvania Manufacturer:

1. Everything possible to help him.

2. By using same.

A New York Manufacturer:

1. All kinds of printed matter, window displays, outdoor signs, cuts, copy and selling plan including newspaper space on 50-50 basis.

2. Use them as we suggest.

A St. Louis Manufacturer:

1. Cards, folders, catalogs, etc.

2. By using them.

W. E. Lamneck Company, Columbus, Ohio:

1. Signs, folders, catalogs, and cuts for newspaper.

2. Direct mail and newspaper.

A Minnesota Manufacturer:

1. Booklets, circulars, cuts and detailed photographs. We also circularize the dealers for jobbers and the prospects for dealers.

2. By distribution of the pamphlets and catalogs to the prospects. By furnishing us with a list of names so we may circularize them.

Campbell Heating Company, Des Moines, Iowa:

1. Several circulars.

2. By cooperating with our plan which he is loath to do.

From an Ohio manufacturer:

1. Road signs, dealers' signs, pamphlets, pencils, cuts.

2. By putting up signs and distributing information direct to users. catalog; in both pipe and pipeless—envelope stuffers, installation signs, fence signs, big banners, complete newspaper ads in electrotype form for the asking. Seventeen pieces of literature in all. Allow $3.00 per furnace for dealer advertising.

The Lennox Furnace Company, Marshalltown, Iowa:

1. Catalogs, folders, electros, pictures slides, made up ads, and a series of special letters.

2. Personal touch and newspapers.

Homer Furnace Company, Coldwater, Michigan:

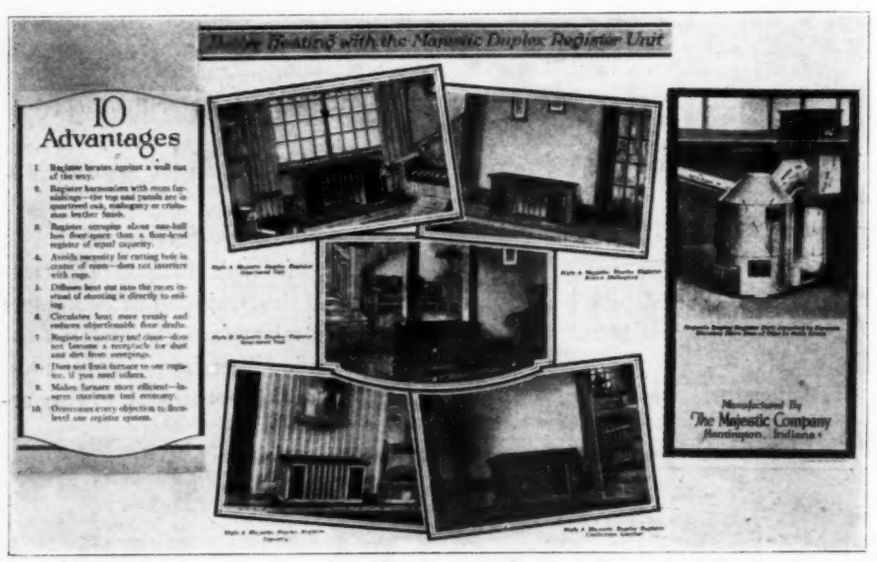
1. Dealers' catalog—consumers'

2. By sending us names of prospects.

Most Installers Agree That Following Up Sales with Service Pays Big.

There certainly is a great deal of encouragement in knowing that the furnace installers realize the value in following up their sales with periodical calls. The Warm Air Furnace Special Questionnaire sent out by AMERICAN ARTISAN revealed this fact.

Pages from Booklets Furnished to Installers by Brillion Iron Works, Brillion, Wisconsin.



Pages from Selling Help Booklets Furnished by Majestic Company, Huntington, Indiana.

Contrary to their usual parsimony in the use of words when asked to answer questions, the furnace installers must be given credit in this instance for waxing quite loquacious.

Seventy-five per cent of those who answered said that they did follow up their sales of warm air furnaces when cold weather sets in by a visit and an assurance to the customer of continuous service.

One man said: "Sure, it makes the customer feel that you're not just after his money."

Another wrote, "We either follow up the sale with a personal call or call the customer by telephone and we find that personal services are most satisfactory."

In answer to the question, "Does this service help in making other furnace sales," this man said: "Yes, it really sells the next job without much effort, as the first customer tells the prospect of your service."

Then it is also interesting to learn the attitude of mind of those in-

stallers who do not make service calls. One man said:

"No, we install too many to do this, but we always leave word with the customer to call us if any trouble occurs with the furnace."

Here is another viewpoint which perhaps has some justification in view of the reputation which some of the installers (a minority number we hope) have made for themselves. This man said:

"Do not deal in new 'stuff.' I only do repair work, as I can make more money correcting faulty installations which the other fellow puts in than by selling the new outfits, and less grief."

Furnace Installers, as a Rule, Make Good Use of Manufacturers' Selling Helps.

Seventy-five Per Cent of Replies to Questionnaire Indicate That This Service Is Appreciated.

THE local furnace installer as a general rule is making a good use of the manufacturer's dealer helps.

The questionnaire sent out by AMERICAN ARTISAN AND HARDWARE RECORD and asking the question, *"What use do you make of manufacturer's advertising helps in your local publicity?"* shows that manufacturers' efforts are proving helpful.

About 75 per cent of the replies showed that the installers were using the material supplied by the manufacturer.

A. A. Clendenning, Keota, Iowa, says that he makes good use of the cuts, circulars and some of the bill board posters.

Anton Johnson, Johnson Sheet Metal Works, East Moline, Illinois, says that he sends out pamphlets with his monthly statements, which he finds productive to a high degree.

E. H. Snow, Sleepy Eye, Minnesota, makes a good use of the circulars, catalogues and other matter sent to him by the manufacturers.

A. A. Richards, N. D. E. Richards & Sons, Roanoke, Indiana, states in no indefinite terms that he uses all the advertising helps he can possibly get from the manufacturer and his business shows that he has profited by their use.

John A. Pontius, Geneva, New York, says that he uses the manufacturer's advertising helps only when business is slow, but this has not been the case for two years. Here is a man who fully appreciates the value of advertising and uses it to iron out the low places in his business. He only needs to be taught the value of continuous advertising.

W. A. Covell & Son, Waterloo, Iowa, says that he uses the advertising helps in the daily papers, through the mail, the cuts and the folders, which he finds has been of great benefit to his business.

The Liberty Specialty Company, Conneaut, Ohio, says that they have used manufacturers' advertising helps very extensively in the past, they say, however, that their greatest advertisement is the successful installation.

Follow-Up Letters and Pages from Dealer Helps Furnished by Meyer Furnace Company, Peoria, Illinois.

W. H. Williams, Baltimore, Maryland, is emphatic in saying that he uses everything he can get from the manufacturers in the way of advertising helps.

It is interesting and encouraging to note that those installers who do not use the manufacturers' helps continuously do use them occasionally and in almost every instance the installer uses his local newspaper.

L. F. Sutterer, Perryville, Missouri, finds that by using the literature and all other advertising help he gets from the manufacturers he derives great benefit. He also uses local newspapers in his adcertising, campaign.

To Make Sure of a Reasonable Profit on an Installation Job, a Cost System Is Required.

Furnace Installers Who Prosper Always Make a Close Estimate and Check It Over as Job Goes On.

ONE question which was contained in the AMERICAN ARTISAN Warm Air Furnace Special Questionnaire concerned itself with the cost finding system as follows:

"Do you use a cost finding system which enables you to charge enough for your time, labor and skill?"

Moving Picture Slides Furnished to Installers by L. J. Mueller Furnace Company, Milwaukee, Wisconsin.

A. A. Clendenning, Keota, Iowa.

Yes. I check each job against the estimate, in order to ascertain where the estimate fell short or long. This enables me to make future estimates more accurate.

C. R. Oberholtzer, Angola, Indiana.

We estimate the cost of labor and then figure the cost of material. When the job is installed, we keep an account of everything—material, labor, cartage, freight and any other items that enter into the cost of making the installation.

Liberty Specialty Company, Conneaut, Ohio.

We do use a cost finding system in connection with our regular bookkeeping system, and it enables us to determine a rate at which we can charge our customer for our service and still make a reasonable profit.

W. A. Covell & Son, Waterloo, Iowa.

A few years ago we had a practice of making a rough guess at the cost of installing a furnace. We now use a cost accounting system in connection with our furnace installations and we find it of great benefit in keeping an accurate account of the materials used in making the proper charges to our customers.

J. E. Nye, Manchester, Iowa.

Yes. We try to figure our jobs so as to make a fair profit on them all. We find the cost finding system of great benefit in properly apportioning the material and labor costs.

Frank R. Jarrell, Hoopeston, Illinois.

I figure my own jobs and have always made some money. I try to sell at a reasonable figure. I cannot expect to dance and let the other fellow pay my fiddler.

Anton Johnson, Johnson Sheet Metal Works, East Moline, Illinois.

Not exactly. Although we have not a distinct system of cost accounting for our furnace installations, we do not make our estimates entirely by guesswork.

A. H. Cobb, Jackson, Michigan.

Yes. We have found it practically impossible to make an accurate and satisfactory estimate of our furnace installations without the aid of a cost finding system.

Lathrop Furnace Company, San Antonio, Texas.

Sure. It would be next to impossible to attempt to make guesswork estimates on the furnace installations.

Unless you prefer to blunder ahead, doing things wrong the first time and having to do them over again, read what others have done and find out the right way to do things at first.

CLEAN WARM AIR HEAT
THE WATERBURY Seamless Pipeless FURNACE
THE WATERBURY Seamless Pipeless FURNACE
A Welded Steel Furnace
Gas, Smoke and Dust Tight
GOOD BYE TO DUST RAG
CLEAN HEAT
THE WATERBURY SEAMLESS FURNACE
Resolve to Make Your House a Cozy, Clean, Comfortable Home
Take This First Step Now
Remember That Our Furnace
The Waterman-Waterbury Co.

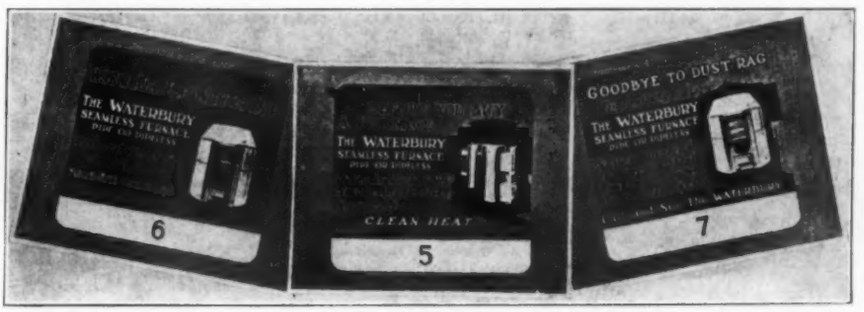
Pages from Selling Help Booklet, Furnished by Waterman-Waterbury Company, Minneapolis, Minnesota.

Warm Air Heating Industry Needs Installer Education to "Pep" Up Business.

Manufacturers of Warm Air Furnaces Not Thoroughly Educating Installers in Setting Up Warm Air Heating Plants.

THE Warm Air Heating and Ventilating Industry is founded upon a sound principle. For economy and healthful heating it can't be equaled. For dependability and responsiveness it is far above any other form of heating.

It is not yet out of swaddling clothes, however, and its universal popularity still depends upon the fickleness of public sentiment. Whether or not that sentiment is going to be favorable to the industry will depend upon the attitude which you men engaged in this business take toward it.



Moving Picture Slides Advertising Waterbury Steel Furnaces, Furnished by Waterman-Waterbury Company, Minneapolis, Minnesota.

There are men in the industry who are bent upon turning out a pile of castings, the outlines of which when assembled, in a vague sort of way resembles a furnace.

There are installers in the industry who with their single track minds think only in terms of price. Why? Because they lack the knowledge of Warm Air Heating necessary to properly install a warm air heating plant.

Whose responsibility is it to see that these men are properly instructed?

Here is where you manufacturers as a whole are overlooking a splendid opportunity to further the industry.

What the Warm Air Heating and Ventilating Industry needs is a dose of that good old fashioned "good for man or beast" remedy in the form of wholesome installer education; these men must be taught furnace installation, and, if necessary, a code of ethics.

The Warm Air Furnace Industry after twenty years of activity can boast a growth of from 30,000 to 400,000 annual installations. This is an average increase of 20,000 installations per annum over the 20-year period.

Compared with the growth of the automobile or the furniture industry, this is rather small and still, as far as necessity is concerned, the furnace is certainly on a par with either of the former.

What you manufacturers need to do is to get together and direct your combined energy toward better selling and installation methods; the installer must be instructed not only how to sell a furnace, but how to sell and install a *Warm Air Heating Plant* so that it will function properly and put a feather in the industry's cap, instead of making a possible black eye.

You have and are perfecting a machine for service.

It is distinctly up to you to see that your machine will be placed so as to render efficiently the service for which it was designed.

Pages from Booklets Furnished to Installers by Schill Brothers Company, Crestline, Ohio.

Selecting the right heating plant
What Gilt Edge Leadership in Product and Service Means to the Furnace Buyer
Superiority in Product
A Remarkable Heating Service
R. J. Schwab & Sons Co.
Milwaukee, Wisconsin

Pages from Booklet Furnished to Installers by R. J. Schwab & Sons Company, Milwaukee, Wisconsin.

Burning Small Sizes of Anthracite Coal.

In speaking of anthracite as a domestic fuel usually only the "domestic" sizes (egg, stove, nut and, to a certain extent, pea) are considered, states the Department of the Interior in Serial 2520, recently issued by the Bureau of Mines. In the preparation of these sizes a certain amount of smaller sizes (roughly 30 per cent of the total) are produced, which are considered as a by-product and sold in competition with bituminous coal as steam coal, at a price below the actual cost of production, according to *Journal of American Society of Heating and Ventilating Engineers* for November.

"Tubular" Tip
HEALTH COMFORT ECONOMY
THATCHER FURNACE
Mr. J.M. Thatcher figured it out and proved it.
FRESH AIR is as necessary to Health as Sunshine—The THATCHER "TUBULAR" Furnace not only warms every corner of your home, but floods it with ozone fresh from out-of-doors—
"THATCHER"
THATCHER FURNACE CO.
Since 1850
Makers of GOOD House Heaters and Ranges
As Necessary to Health as Fresh Air and Sunshine—
"THATCHER"
Warm Air
"TUBULAR" FURNACE
in your home
The "tubes" conduct the air fresh from out of doors, so rapidly over the hottest fire that none of the life giving qualities of the air are lost—and quick and healthy heat is secured at little cost.
Your Warm Friend
Ask your dealer about the "Thatcher" Line. Stand for healthy
THATCHER FURNACE CO.
Since 1850
Makers of GOOD House Heaters and Kitchen Ranges
PURE AIR + HEAT = HEALTH
AIR — VITALITY = DISEASE
THATCHER
The "Thatcher Tubular" ventilates while it heats.
"THATCHER"
It requires a continual flow of 20 cubic feet of pure fresh air every minute to replace the same amount of vitiated air exhaled by a normal person. Therefore, if the lungs are not supplied with an equal amount of pure fresh air health will be sacrificed.
The Thatcher "Tubular" Warm Air Furnace heats with pure fresh air.
Your Warm Friend
THATCHER FURNACE CO.
Since 1850

Some of the Ready-to-Use Advertisements Furnished by Thatcher Furnace Company, Chicago and Newark, New Jersey.

Although these steam sizes can not often be burned alone with natural draft at a sufficiently high rate of combustion to produce the necessary amount of heat in the ordinary furnace, they are in use to a considerable extent, either mixed with some other coal or with coke, or unmixed using forced draft. The size usually used is No. 1 buckwheat or yard screenings, although No. 2 and even mixtures of No. 2 and No. 3 buckwheat are used in certain localities with forced draft installations.

No. 1 buckwheat and yard screenings can be mixed with the larger domestic sizes (preferably egg coal), with coke or with bituminous coal. The proportions of the two sizes or kinds of coal are contingent on the size of the furnace with relation to the amount of heat to be supplied, on the draft available, or on the outside temperature, and can only be determined by experiment. They may range from equal quantities of each to one part of substitute to three parts of basic fuel. By trial it will be found that the proportion of substitute can be increased in mild weather when not a great deal of heat is necessary, but must be decreased or even omitted entirely during the most severe weather when the furnace, must be operated to its maximum capacity.

When using small sizes with large anthracite or coke it is best not to mix them, but to fire separately in layers, first a layer of the larger fuel and then a layer of the smaller.

Occasionally a furnace has sufficient grate area to burn a sufficient quantity of No. 1 buckwheat to produce the necessary heat with natural draft. In that case, it is only necessary to reduce the size of the grate openings to prevent too great an amount of unburned coal falling into the ash pit. This can most readily and cheaply be done by laying a plate of iron, closely perforated with half-inch holes, or a piece of heavy half-inch square mesh galvanized iron netting, loosely on the grates.

Ordinarily it will be found that forced draft is necessary. This can be created by a small electrically-driven fan or blower connected with the ash pit and either automatically or manually controlled. The ash pit should be made as tight against air leakage as possible. The stove pipe damper must not fit tightly, to avoid the possibility of the furnace gases being forced into the cellar instead of escaping through the chimney should the damper be accidentally closed.

Copies of Serial 2520, Fuels Available for Domestic Use as Substitutes for Anthracite Coal, by Rudolf Kudlich, may be obtained from the Department of the Interior, Bureau of Mines, Washington, D. C.

Some Front Rank Advertisements Run in Farm Papers by Haynes-Langenberg Manufacturing Company, St. Louis.

Legislating for Uniform Installation Laws, Manufacturers Believe, Will Not Produce Desired Results.

Legislation Puts Whole Question Into Politics, Which Would Not Be Practical for Obvious Reasons.

IN order to shed light upon the attitude of manufacturers towards using the statute books to produce uniform installation laws throughout the country, AMERICAN ARTISAN Questionnaire sent to manufacturers brought out some interesting facts.

The feasibility of licensing warm air furnace installers by the state was also included in a corollary to the first question.

The questions asked are as follows, and the answers follow the name of each manufacturer:

1. *"Do you approve of uniform legislation throughout the country governing the details of Warm Air Furnace installation?"*

2. *"As a logical corollary of such laws, do you approve the licensing of Warm Air Furnace installers by the state laws?"*

American Furnace Company, St. Louis, Missouri:

1. This is dangerous ground. Yes, if properly made and enforced. No, because they are usually abused and work in favor of factions.

2. No. Why? Such power has been badly abused by certain interests.

The Waterman-Waterbury Company:

1. Yes, provided the new national Code is the one adopted.

2. No.

Brillion Iron Works, Brillion, Wisconsin:

1. Yes.

2. No answer.

An Ohio Firm:

1. Yes.

2. No. Too much politics.

St. Clair Foundry Corporation:

1. Yes.

2. Yes.

A Wisconsin Firm:

1. No and yes. The tendency of legislation is to dictate too much in detail, instead of legislating to accomplish certain required results.

2. No.

The Quick Furnace & Supply Company, Des Moines, Iowa:

1. Yes.

2. No. Have a good furnace inspector with a good Code from which to work.

Phillips Heating, Ventilating & Maufacturing Company:

1. Yes, if they can be made practical.

The Importance of Correct Humidity for Health and Comfort in Home Heating
Greater Health and Comfort and a Smaller Coal Bill with a
GILTEDGE
Automatic Humidifier

Pages from Booklet of Premier Warm Air Heater Company.

2. Yes.

An Ohio Maker:

1. Yes.

2. Yes.

A Pennsylvania Maker:

1. Anything to produce the best service for the consumer.

2. We do not know how this would work.

A New York Maker:

1. Yes. On the theory that any uniform legislation is likely to elevate the art.

2. Yes.

An Ohio Manufacturer:

1. No answer.

2. No.

A St. Louis Manufacturer:

1. No.

2. No answer.

W. E. Lamneck Company, Columbus, Ohio:

1. Yes.

2. No.

A Minnesota Maker:

1. In reply to this question would

Pages from Pamphlet of R. J. Schwab & Sons Company.

say yes, with reservations; these reservations are to be regulated by the conditions existing in the various localities.

2. Yes.

The B. C. Bibb Stove Company, Baltimore, Maryland:

1. Yes.
2. Yes.

Another Ohio manufacturer says:

1. Yes.

Campbell Heating Company, Des Moines, Iowa:

1. No. Not very enthusiastic because so many errors creep in and so much "red tape." It curtails a man's freedom to give customer benefit of his experience. Too much legislation now. We will soon be legislating the hour at which a man shall eat his meals.

2. No.

The Superior Warm Air Furn
A Distinctly High Grade Heater
NEW IDEA (Type A) Re-Circulator
SUPERIOR PIPE AND NEW IDEA PIPELESS
SUPER-SMOKELESS
WARM AIR FURNACES
Utilizing the Principle of the Bunsen Burner
Superior SUPER-SMOKELESS Furnace

Pages from Selling Helps Booklet of Utica Heater Company, Utica, New York.

2. Yes.

The Lennox Furnace Company, Marshalltown, Iowa:

1. Yes.
2. No answer.

The Wise Furnace Company, Akron, Ohio:

1. Yes.
2. No.

Barber Manufacturing Company, Ashtabula, Ohio:

1. No.
2. No.

Homer Furnace Company, Coldwater, Michigan:

1. No, not necessary.
2. No! No! No!

As is shown by this questionnaire the manufacturers as a whole are willing to support the Code, but as for legislation, they believe there is too much of that now and legislation of the sort mentioned would merely throw the whole matter into politics, which for obvious reasons would be inadvisable.

Range of Manufacturers' Prices Over a Period of Ten Years.

Some very interesting data was produced with respect to the sales and prices of furnace manufacturers over a period extending back approximately ten years by the AMERICAN ARTISAN Warm Air Furnace Special questionnaire.

The following questions were asked:

1. *"How much lower are your present prices than those of January, 1920?"*

2. *"How much higher than those of 1914? Of 1917?"*

3. *"What percentage of gain or loss do your sales of warm air furnaces show in comparison with 1922? With your previous best year?"*

The answers to these three questions were greatly varied.

To question No. 1 four said they were not in business prior to 1920; five said prices were about the same as in 1920; four said 20 per cent lower; five, 10 to 15 per cent lower; two said 20 to 25 per cent lower; two 30 per cent, one 33 per cent, one 38 per cent lower and one 40 per cent lower than 1920. It is interesting that out of the entire group questioned there were but two who reported prices higher than 1920, one 6 per cent and the other 5 per cent.

The answers to question No. 2, first and second parts, are so varied that it is impossible to explain the wide difference. They ran all the way from 10 to 136 per cent higher than the prices of 1914. The difference in prices from 1917 ranged from 20 per cent to 80 per cent higher.

The percentage of gain or loss for 1923, compared with 1922, were also interesting; they ran from 30 per cent to 100 per cent gain, and the curious thing about it is that few manufacturers showed any equality in these percentages. One showed a 60 per cent loss and one a 50 per cent loss.

Every page in this issue is worthy of your careful study.

Gravity Oil Burner Manufacturer Tells of Progress Made in This New Industry.

He Discusses Types of Burners, Kinds of Fuel Oils Adaptable and Safety Points.

IN the following article a prominent manufacturer of gravity oil burners gives some valuable information which should be of interest in view of the rapid growth of the oil burner industry:

On Burning Oil in Your Home.

Oil burning devices as they exist today can be classified in four classes as follows:

1. Residue oil burners.
2. Power feed oil-gas burners.
3. Power-gravity oil-gas burners.
4. Gravity oil-gas burners.

That is to say, there are residue oil burners and burners using the lighter by-products mixed with air or vaporized and mixed with air. In the latter classification, there are several types and methods in use.

Residue Oil Burners.

Residue oil burners are not generally adaptable to use in the home. Residue oil is not by any means the ideal fuel for home use. High carbon content and the presence of many not-readily-combustible elements, together with viscosity and great bulk are the main objections. However, the fuel itself is very low in cost, and many of the residue oil burners are very economical machines. It is a question whether oil burners are really adaptable for home use, but the very fact that the great majority of manufacturers prefer to make burners burning lighter by-products, seems to indicate that this latter class is by far the most successful.

Power Feed Oil Burners.

Among the burners burning light oils—or fuel oils, as they are commonly called—the majority rely on some mechanical contrivances to bring the oil from the tanks to the burner and upon further mechanical aid to atomize the oil before it issues forth into the furnace to be burned. Most of these burners require a pump and an atomizing device driven by electric motors and moving parts. This, of course, makes this type of burner complicated—many of them to the point of absurdity. While there may be some truth in the fact that these burners are more steady on account of having mechanical feed, it is to be doubted if this offsets the fact that where there is motion there is friction and the resultant wear. Furthermore, the majority of them are noisy to the n-th degree and vibration is omnipresent in them to a large extent. They are successful in getting up to very high temperatures and this point is in their favor, but it would be absurd to think of heating a house to these excessive temperatures.

Well Known Gravity Oil Burner.

Power Gravity Oil Burners.

In this type of burner, gravity is relied upon to bring the oil from the tank to the burner and artificial power is called upon to atomize the oil and to create the draft and necessary air mixture before it is ready to burn. Consequently, moving parts enter into consideration again, and while the pump is discarded there is very little gained in the way of quiet and simplicity, for power and complicated devices are still necessary. In some burners, the oil is atomized by a rapidly rotating pan, in others by forcing the oil through the orifices under pressure, while in other types a variation of devices is employed.

Gravity Oil Burners.

For simplicity of construction and operation, the gravity burner is undoubtedly without a peer; in addition, there is freedom from any moving parts, no electrical devices or complicated machinery necessary, and the burners can be sold for a fraction of the price of the more complicated devices. This, however, does not mean that they are any less efficient or satisfactory than the other burners. Quite the reverse is usually the case. While in these burners, the main disadvantage is the fact that the tank must be higher than the burner, this is a minor point when consideration is given to the fact that simplicity of construction, lower cost, and freedom from noise and vibration go with this burner. The pre-heating of oil vaporizes it and this vapor is forced through a tiny orifice under the pressure of gravity, but the weight of the oil back in the pipe gives all the atomization necessary for its successful operation. This oil-gas is then mixed with air as it emerges from the orifice and the mixture burns to make the heat. One of the biggest advantages of this type is the fact that natural draft is used, obviating the necessity of employing motors or any artificial means of creating a draft. This eliminates unnecessary noise parts and expensive equipment.

Oil Burning vs. Coal.

There is no doubt but what oil has become the most desirable fuel for the home. There is none of the soot, ashes, and muss that is part of coal-burning, and in quite a few sections of the country where oil can be purchased cheaply there is a big saving in the fuel cost. In general, however, oil will run slightly more than coal as far as the bare fuel cost is concerned, but when one considers the fact there is no ashman to pay, no janitor required in many cases—most oil burners can

Ready-to-Use Advertisements for Globe Furnaces.

be equipped with thermostats that give automatic control from the upstairs—not to mention the great factors of cleanliness and freedom from shoveling coal, banking fires, uneven heat, and the danger of overheated flue and popping coals, it is considerably cheaper.

Safety a Big Factor.

There is a popular opinion that the burner oils—especially kerosene—are highly explosive and inflammable. This is true only if a wick is supplied or the oil pre-heated. Otherwise kerosene will extinguish fire as readily as water. This, following explanation of gravity oil burners makes it seem that that type is dangerous. Safety is therefore a big factor in oil-burning.

Practically every oil burning device has some safety device that precludes any possibility of danger from overflowing, thereby creating a fire-hazard that might in any way jeopardize the insurance. Because of the fact that people can not readily believe that there is no more danger from burning oil than there is from coal, manufacturers have done everything possible to bring the possibility of any mishap to the minimum. So far, there has been complete satisfaction for the great majority of users of oil burners in the matter of safety, and it is a fact that public confidence comes only after use of a product. Thus, oil burner manufacturers are daily finding the public antagonism to oil burners because of supposed danger becoming less and less of a stumbling block.

Which Oil Shall I Use?

As has been explained before, the viscosity and difficulty of obtaining residue oil—a product very near crude oil in chemical make-up—has made it an impractical oil to burn. It is very subject to temperature change, and at low temperatures is almost solid. Furthermore, a great deal of mechanical work is necessary before the oil is made readily combustible. Most of the oil companies now have certain inexpensive oils known as distillates or furnace oils that are readily and easily procurable. In fact, most companies have special trucks with long filling hoses that make regular calls at the houses of oil burner users and fill their tanks in much the same way as an automobile owner fills his gasoline tank or more specifically in the same way that filling stations replenish their supplies by deliveries from the wholesale oil companies. Thus, oil of the light body variety has become easy to obtain and easy to replenish.

What Type of Burner Shall I Use?

In regard to this question, it is just as unanswerable as the question, "What kind of an automobile shall I buy?" It is just a matter of taste and cost. In residue oil burners, the disadvantage lies in the fuel and the complicated mechanism necessary for its operation. In power burners there lies the disadvantage of machinery and complications necessary for its successful operation, and in the power-gravity type the same objection applies with the additional minor objection of having certain limitation regarding the placing of the storage tank. With the gravity type, all objections except the tank limitations are removed and the quiet and simplicity of this type make it by far the most desirable from the standpoint of many users—especially owners of homes having less than 18 to 20 rooms.

Will Oil Burners Work?

There are hundreds of thousands of oil burners of various types in use in homes throughout the world today. The number of dissatisfied users in proportion to satisfied users

Greatest heating surface
means most fuel economy
A furnace with scanty heating surface wastes valuable fuel. The Mueller Double Radiator Pipe Furnace has more heating surface than any other furnace of like size fire-pot, and saves many dollars in fuel every winter. This fact alone is worth knowing more about—come in and learn why.
MUELLER
FURNACES
— dependable heat —
(DEALER'S NAME)
(ADDRESS)
HEAT
You Need the Facts
In This Interesting Book
"HEAT" tells you the story of dependable heat—the kind you must have in your home for winter health and comfort. Every fact in "HEAT" is vitally important. Get a free copy today and see why. And when you call for your copy, ask about the Mueller Guarantee.
MUELLER
FURNACES
— dependable heat —
(DEALER)
(ADDRESS)
In over 222,000 Homes
MUELLER heating plants are delivering dependable heat in over 222,000 homes everywhere every winter. In thousands of them the famous Double Radiator Pipe Furnace above has been the selection.
Come in today and learn why.
MUELLER
FURNACES
— dependable heat —
Convenient payments
(DEALER'S NAME)
(ADDRESS)

Three of the Many Retail Advertisements Furnished to Installers by L. J. Mueller Furnace Company, Milwaukee, Wisconsin.

is almost negligible. Of course, like many other new devices, there is much to be done in educating the public to the fact that a lot depends upon the way a user operates his burner and of the care he gives it. Many people have the erroneous impression that when they install an oil burner they are not only free from the drudgery connected with the use of coal, but they also think that all they have to do is light the burner and forget about it. With a thermostat in the house, it is very probable that the user may not have to go into his basement during the entire winter, as far as stoking and heat regulating is concerned, for his heat can be regulated by setting his thermostat.

Now, every oil burner is in some way mechanical—using the strict construction of the word—for even the gravity type that uses only Nature's own laws are subject to everyday mechanical laws of combustion, and even in this type it is wise to give it a little attention every day if only for the purpose of keeping the orifices clean. In power using types it is necessary to keep the moving parts oiled and all parts in good working order. However, an inspection of the burner once or even twice a day is nothing as compared to the constant watching that coal fires require, not to mention the shoveling of coal and ashes, shaking and cleaning grates, and the dirt and muss that results. Then, too, oil gives the steady even heat that is so necessary to health in cold weather. The up-and-down heat caused by the unsteadiness of the supply of combustible gases in coal burning, is dangerous to health.

The tremendous growth of the oil burner industry in the past decade is the most convincing proof one could ask for as to the efficiency of burning oil. A new device either dies a natural death due to failure to live up to its maker's claims, or it lives up to them and builds up the maker's business to great proportions. Each succeeding year shows a big increase in sales in manufacturing facilities of most oil burning equipment manufacturers. If oil burners were not all that are claimed for them, public opinion would have killed them long ago.

Look over the
INTERNATIONAL
ONEPIPE HEATER
catalog before selecting any heater. Call at our store or send post card request for this valuable book on how to obtain heat comfort with economy.
Just ask for Onepipe book.
(YOUR NAME HERE)
Heat Comfort at Low Cost
There is a satisfaction that cannot be measured in dollars in having a warm, cozy home. All of us want a heater that will provide that comfort and satisfaction at the lowest possible cost.
INTERNATIONAL ONEPIPE HEATER
made in two styles and many sizes, are especially well suited for homes that now have stoves. They comfortably heat every room in the house from one pipe and register, are easy to install, and are the most economical heaters for the average home.
Call and let us explain the many features of INTERNATIONAL Onepipe Heaters. It may save you many dollars.
(YOUR NAME HERE)
Heat Comfort at Low Cost
The comfort of a warm, cozy home can not be measured by dollars. Yet you want this comfort at lowest cost.
INTERNATIONAL ONEPIPE HEATERS
are especially suited to homes now heated by stoves. They give comfortable heat and are more economical in the average home than other types of heaters.
(YOUR NAME HERE)

Some International Newspaper Advertisements That Installers Can Obtain from International Heater Company, Utica, New York.

Manufacturers Believe Oil Burners Not Sufficiently Developed for Practical Use.

Although Rapid Progress Has Been Made in Developing Them, Furnace Men Find Only a Few Satisfactory.

AS is well recognized, the furnace manufacturers, as well as the furnace installers, are actively interested in the development of the oil burner. Therefore in the questionnaire sent to furnace manufacturers of warm air furnaces and supplies, AMERICAN ARTISAN AND HARDWARE RECORD asked the following questions regarding oil burners and their use:

"What is your opinion as to the efficiency of the gravity oil burners which are now on the market when used in warm air furnaces?"

"Would you recommend any of the more prominent pressure oil burners for use in your make of furnaces?"

The following answers were received answered in rotation:

Haynes-Langenberg Manufacturing Company, St. Louis, Missouri:

1. No answer.

2. No. Waiting for more development; some are apparently good, others poor.

Homer Furnace Company, Coldwater, Michigan:

1. We have been looking for years for a successful oil burner, but have not seen one suitable so far.

2. Motor-driven burners, such as No-Kol, are fine but too expensive.

St. Clair Foundry Corporation, Belleville, Illinois:

1. Do not believe them to be foolproof and far from being perfected to any high degree.

2. We do not recommend them, nor do we condemn them.

Brillion Iron Works, Brillion, Wisconsin:

1. No comment.

The Waterman-Waterbury Company, Minneapolis, Minnesota:

1. There are two gravity oil burners which have come to our attention which seem to be very efficient.

2. Yes. Our furnace is a seamless furnace. It is absolutely gastight, thus making it impossible for the fumes to penetrate into the casing.

Quick Furnace & Supply Company, Des Moines, Iowa:

1. The consumption of fuel is too great and the cost of installation too high at the present time.

2. No.

Phillips Heating, Ventilating & Manufacturing Company, Los Angeles.

1. Gravity oil burners are all right where the flue is O. K., but they need a good deal of nursing at times, especially when the weather is bad and the drafts are poor.

2. No, not in small furnaces. Pressure burners are only good for large buildings where an experienced fireman is in charge.

An Ohio Manufacturer:

1. We have had no experience.

2. Any prominent oil burner which will work successfully in other furnaces can be used successfully in ours.

A Pennsylvania Manufacturer:

1. We have so far found nothing suitable for our furnaces.

2. We have never used any of these burners.

A New York Maker:

1. We have had no experience with gravity oil burner.

2. No.

Barber Manufacturing Company, Ashtabula, Ohio:

1. Good.

2. No.

A Minnesota Manufacturer:

1. Our experience in the efficiency of the gravity oil burner has been that they have not reached the point where they are entirely practical.

2. No.

A Dowagiac, Michigan, Maker:

1. Would rather not say.

2. Glady, some of them, but not to guarantee them.

The Lennox Furnace Company, Marshalltown, Iowa:

1. Not favorable, but open to facts.

2. Yes.

The Wise Furnace Company, Akron, Ohio:

1. Not satisfactory.

2. Yes.

American Furnace Company, St. Louis, Missouri:

1. Oil is splendid fuel for furnaces if the proper burner is selected.

2. We believe it best to have the oil burner makers put forth their own arguments. Any dependable burner will operate in our furnace.

Campbell Heating Company, Des Moines, Iowa:

1. Undecided. Some work well, some do not under varying conditions.

2. Yes, certainly.

PREPARE NOW

DON'T SHIVER NEXT WINTER

Why delay in solving your heating problems? Right now is the most economical time to install a warm air furnace. Don't wait until the Fall Rush comes, with high labor cost and advancing market.

Rudy says: "It didn't look like rain when Noah built the Ark."

RUDY TOP RADIATOR OPEN VIEW

Features

Large Radiator with oval clean-out

Generous Feed Mouth Section with Double Doors.

5-Gallon Water Pan With a Self-Cleaning Cover.

Heavy, Triangular Grates, removable in 30 seconds.

We Bought to Your Advantage

Having bought a quantity of Rudy Furnaces at a low point in the market, we can quote you the finest furnace job on the market at a very reasonable price. The Rudy has the smoothest, best fitting castings, and is excelled by none in point of fuel economy. A Rudy will save you money every year you operate it.

Avail yourself of the Rudy Heating Engineering service—without any obligation.

We also Specialize in Sheet Metal Work

SCHANCK HARDWARE CO.

Telephone 39 LIBERTYVILLE

This Retail Advertisement Has a Strong Appeal.

Have You Made Up Your Budget for 1924?

When we start on a journey we predetermine the cost and prepare. Why can we not do exactly the same thing before we start another year's business?

Try it. Make up a budget and include every dollar you expect to spend next year *in your business*. Do not forget to include as an expense to your business the profit you expect your business to pay you; also your salary, office help, labor, rent, electric current, water rent, taxes, donations, telephone and toll charges, telegrams, depreciation on tools, trucks and fixtures, cost of supplies to be bought and used up, fuel, repairs, stamps, stationery, trade journals, association dues and trips to conventions, in-

coming freight and drayage, bad accounts allowances, meals and board when away from home on jobs, insurance, interest on borrowed capital, and miscellaneous expenses.

Add up the whole year's costs of all these items, estimate the amount of business you expect to do, subtract these costs from the amount of business and you will have the exact amount you will have left with which to buy merchandise. Try it.—*The Gas Draft.*

Bryce Discusses Various Fuels and Application of Fans for Heating Plants.

Canadian Health Officer Makes Well Pointed Suggestions for Improving Service.

HERE is a very interesting article by Peter H. Bryce, a Canadian health officer. It was published in the November issue of the *Heating and Ventilating Magazine:*

It is rather remarkable that with the great advance made in the manufacture of fuel consumers of every kind in motion machinery, so little progress has been made in the science of house heating and ventilation, though the price of coal has increased three times. Steam, hot water and hot air have until now been used in connection with anthracite, soft coal and coke. Speaking generally, the situation as regards efficient heating remains in the hands of the ordinary householder, who is naturally profoundly ignorant of the principles which underlie combustion. The same lack of efficiency is seen in the application of principles, not only to the production of heat, but to its distribution and conservation when produced.

The writer, who, as a Provincial Health Officer for many years, has had his attention drawn to many engineering problems, wrote nearly thirty years ago a pamphlet on "House Atmospheres or Artificial Climates," in which were illustrated some of the serious effects on health due to bad heating, lack of ventilation and excessive dryness of the air of houses in northern climates in America. In the following remarks he wishes to indicate some of the most important factors which enter into this problem, and methods for insuring efficiency.

1. Where it is everywhere and at all times available, there is no question but that electric heating is the most convenient, clean and satisfactory, and that where it sells at ½ cent to 1 cent a kilowatt-hour, as in several centers in Ontario by "Hydro" supplied by the Government, it is cheaper than anthracite at present. But as this is not as yet generally available, we shall turn our attention to other sources of heat.

2. Undoubtedly American anthracite for the ordinary water heating and warm air household furnace easily takes the first place among coals of every kind as regards its heat units, its steady glow and its cleanliness; but unfortunately the supreme control of the supply, with the visitation of annual disputes between operators and labor, in which the public is not only inconvenienced, but kept "cold with fear" of a lack in the supply each winter with its constant increase in prices, is making the people sick for other means of a fuel supply.

3. Perhaps at the present moment the most natural direction in which the people are turning is to the use of oil as a fuel, in view of its greater number of heat units, its cleanliness and lessened cost of labor. Could it be utilized, like pro-

Installed in a Few Hours!
A few simple tools, a few hours work and the job's done! In any house, old or new, we can easily install an
INTERNATIONAL ONEPIPE HEATER
under the house and hardly disturb the home. Only ONE register in ONE room to install. Then you immediately begin to enjoy the comfort of healthful heat in every room of the house.
Investigate this wonderful heater that is so convenient and so economical. We have a sample on our floor. Come in and let's talk it over.
KELLY HARDWARE CO.
15 BROAD STREET
"The One Price Store."
INTERNATIONAL ONEPIPE HEATER
Telling His Story Well.

ducer-gas and coke, for central heating, it is certain that with its relatively high number of heat units per pound (20,000 B. t. u., as compared with 12,000 B. t. u. for anthracite), it would prove to be a most satisfactory fuel, as is seen in its use in steamships and locomotives. But even though such central heating is not yet generally possible, the use of oil as a household fuel has come into practical use, and with the improvements in the automatic regulation of the supply of oil, and at present prices, and with more complete combustion, it is going to play an important part in the solution of the fuel problem.

4. In the successful use of every kind of fuel it is necessary for the householder to know what is aimed at. For instance, bituminous coal has some 35 per cent of volatile carbon, which in ordinary furnaces has its units as fuel almost wholly lost up the chimney, the loss of heat units in locomotives being over 90 per cent of the total. Much better results can be obtained in stationary, underfeed, automatically-stoked furnaces, where the gases pass over an incandescent flame supplied with air by a blower.

5. It is apparent, then, that it is the intimate mingling of the oxygen of the air with the heated particles of coal, gas or oil, which insures the highest degree of combustion and heating economy. The ideal is the blue flame of complete combustion seen in the ordinary gas range, where the air and gas are intimately mixed before reaching the burner. This is largely obtained by first heating the crude oil carried under the boilers on ships and then driving it under pressure through a minute opening where it meets with the current of fresh air, and is atomized insuring very complete combustion.

6. A similar attempt has been made with increasing success in the household furnace, where a small electric motor is used to drive the air into the furnace where it meets with a small stream of oil from which the gasoline and lighter oils have been driven. This oil flows from a gravity tank or is supplied by a pump. In this case it is found, as on shipboard, that preheating the oil to a point lower than where it "cracks," or where the carbon and hydrogen of the oil dissociates and carbon tends to collect in the supply tube, aids greatly in the atomizing of the oil and the intimate mixing of the air, which insures complete combustion. Various means are adopted to insure this, but in every case the fan supplies the air with its oxygen for combustion.

7. In every case, however, when the fan is used, a loss is liable to occur from the forced draft, driving the heated gases of combustion through the sections of the furnace before the heat can be absorbed by the water or air sections, to the ex-

There's a Homer Dealer in Your Town

There's a Homer dealer located in your town.

—a man who has the interest of your community at heart, who is helping to make it grow, and paying taxes to maintain its civic institutions,

—whose money is spent locally so that it may circulate in your town and a percentage come to you,

—who is possibly known to you in person, or probably by reputation.

—who is in business, and is going to give service to you because he wants to *stay* in business.

This man sells the Homer furnace because he believes in its principle, construction and efficiency. He wouldn't risk his reputation by selling a furnace that couldn't satisfy, because his future is in your hands.

If you are in the market for a heating system for your home, or expect to be at any future time, call in and get better acquainted with this man. No obligation—just a "visit"—and he'll like it. His name is:

Chas. Schoen & Son
Oconomowoc, Wis.

It Heats
It Ventilates
It Satisfies

Less Price
Less Fuel
More Heat

HOMER
ORIGINAL PATENTED
PIPELESS FURNACE

This Installer Believes in His Furnaces.

tent of a loss of at least 25 per cent of the heat. In warm-air furnaces, drums around the smoke-pipe and a long length of pipe leading through rooms have been used to lessen the loss; but they have been only partly successful and success is only obtained when the gases of the first furnace are carried through a second, or some such means are adapted as a "Manny" heater, which consists of a number of small tubes, with a water jacket around them, through which the hot gases go to the chimney.

8. Having dealt with the heating problems, the most important matter is the air distribution throughout the house. Undoubtedly hot-water coils insure the conduction of heat to each room, where the hot pipes radiate their heat, and in which a good circulation will insure the passing of water at 180° Fahrenheit through the coil, losing the most heat per minute at this high temperature, but returning to the boiler with little loss, and so requiring the least heat to maintain the temperature. If the furnace be a warm air one, then the shortest directly-ascending number of pipes to floor registers in near rooms is both economical and certain of best results, if in installing the system a number of small exhaust pipes on the outer walls of north, east and west rooms have been installed, leading back to the draft in the ashpit of the furnace.

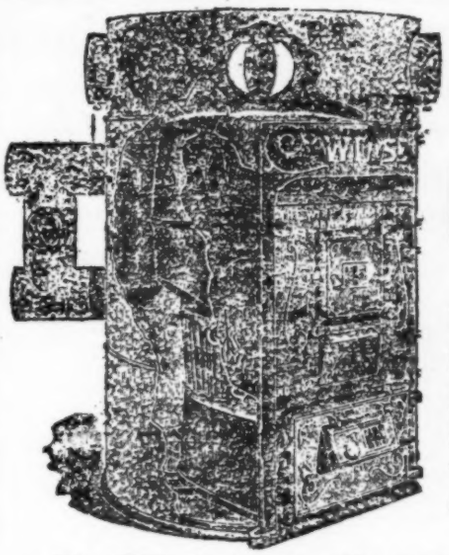
9. Another point of much importance is the supplying of a moderate amount of fresh outer air directly to the warm air jacket of the furnace, to insure not only fresh air in the house, but also to create a plenum or fullness of pressure from within outward, which is accomplished with certainty when the far-off rooms are partially emptied by the return pipes to the ashpit. So drafts from around windows and under doors are prevented and a notable saving of fuel insured.

10. In all cases successful and economical winter heating demands that the loss from high-conducting panes of glass windows be overcome or lessened by closely-fitting double windows, and a deep air space between them, since of all substances, air is the best non-conductor. Of course, hollow walls and air spaces between the lath and wall, as well as tar paper and other non-conducting materials, such as hollow bricks, greatly increase the heating efficiency by preventing loss through conduction and radiation of heat from the walls.

11. Being assured that these matters have been attended to, the question of moisture in house air in winter is of supreme importance. To understand this it is only necessary to know that outside air at zero can only hold ½ grain of water per cubic foot, but that when this air enters the house and is heated to 70° Fahrenheit, it can hold 8 grains of water, or sixteen times as much. Hence, since house air ought to have 50 per cent to 55 per cent of moisture in it, it is apparent that about 4 grains of water must be evaporated to supply enough moisture for every cubic foot of air space in a house, if the air changes once every hour.

In other words, if the cubic feet of air space in a house is 25,000 cubic feet, such as an ordinary house about 30-foot x 25-foot x 35-foot, it needs to receive from 1 gallon to 1½ gallons of water in the shape of vapor every hour. To those who have seen the little 2-gallon pot in the ashpit of the ordinary warm air furnace, this may seem absurd, yet such is demanded. Fortunately, apparatus is now obtainable where the required supply of moisture can be assured at a very moderate cost by attaching the appliance either to a water heating boiler or warm air furnace, or to an electric heater.

It is good salesmanship for the hardware dealer, in his advertising and elsewhere, to stress the argument that his farmer customers should be prepared for the haying and harvesting season with sound rope and a good supply of twine. The cost of rope or twine is exceedingly small compared with the loss of time and damage to crops which may be occasioned through breakage of rope or shortage of twine.



Wise Furnaces

Better get your order in now and avoid the Fall rush. Soon the Snow will fly and you will wish for a modern plant.

The WISE furnace is built by one of the oldest manufacturers, in the most modern Furnace Foundries in the State. Be wise and buy a WISE FURNACE today.

N. S. GATES & SON

201 North Main St. **Phone 412-W**

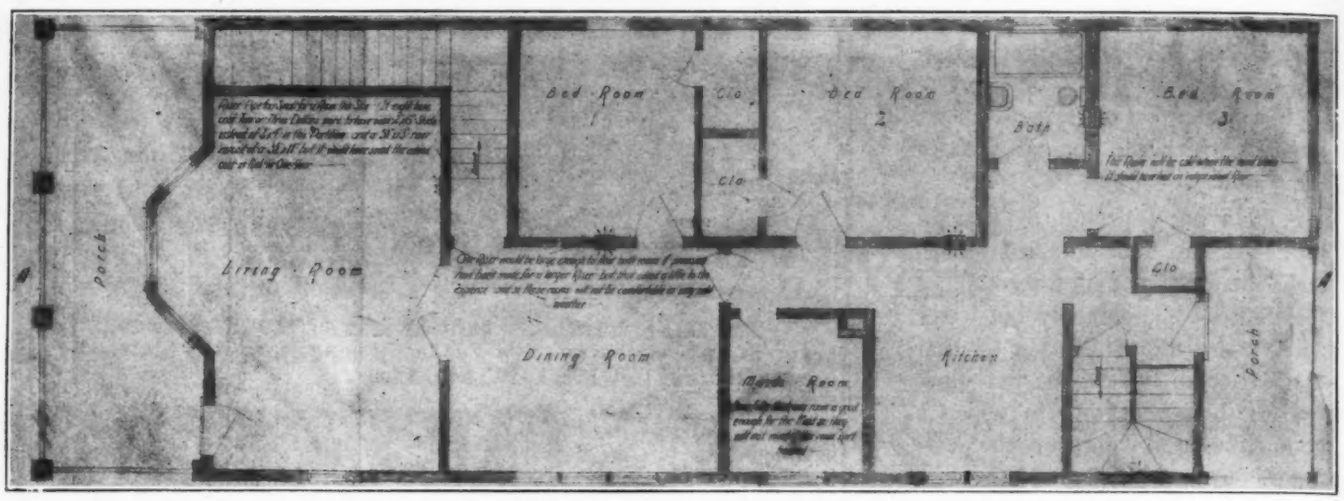
A Short Story Well Told.

This Is a Story About an Exhibit; the Chief Purpose Was Not to Sell Warm Air Furnaces.

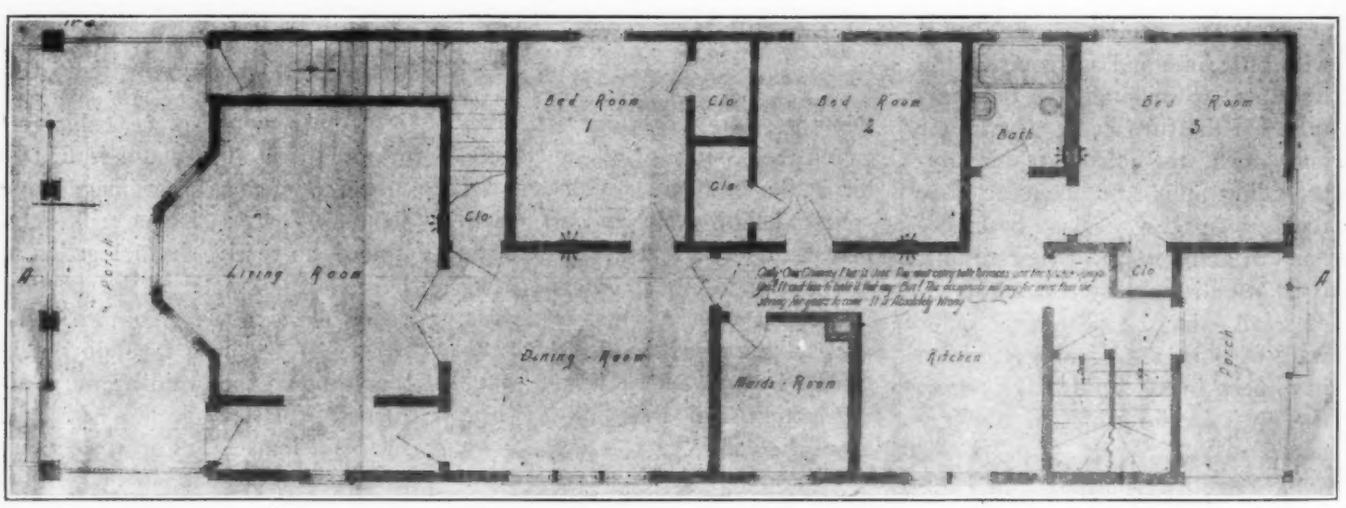
People Had It Demonstrated to Them That It Was Cheaper to Have a Good Job Done Rather Than a Low Priced One.

AFTER all, there is nothing like actual facts and figures when it comes to prove that a thing is so, and the following article, the facts for which were obtained from J. L. Carr, of the International Heater Company, furnishes an idea which is well worth carrying out in other cities. In Utica, New York, where the plan was tried out, it has done a lot of good.

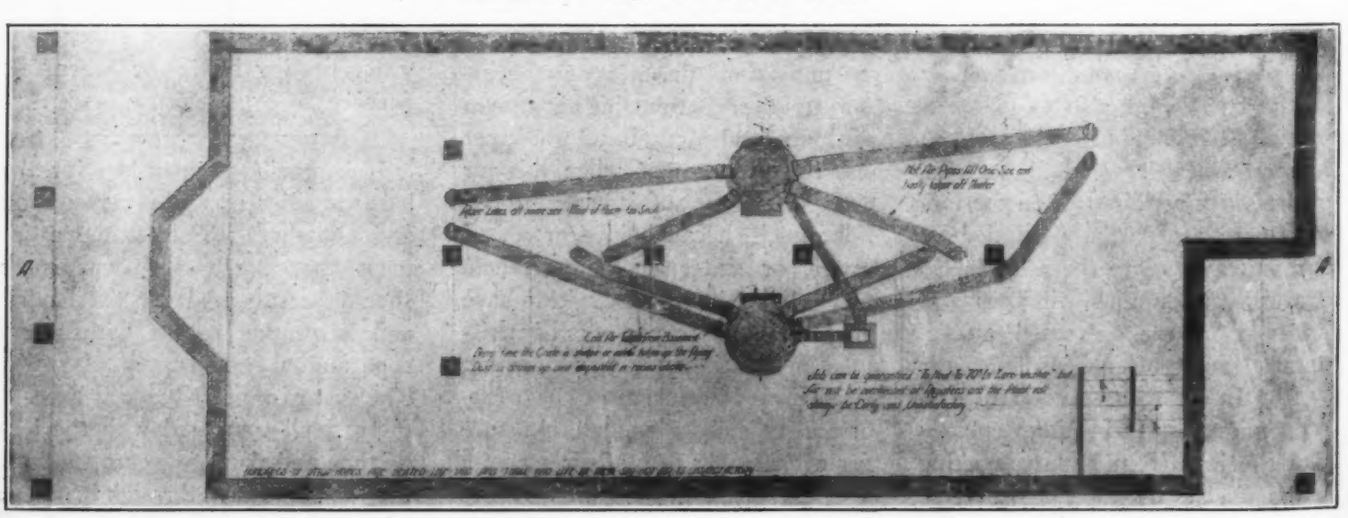
Here is the idea:



Contractor's Layout for Second Floor.



Contractor's Layout for First Floor.



Typical Cheap Contractor's Basement Layout for Two-Family House—Faulty in Many Respects.

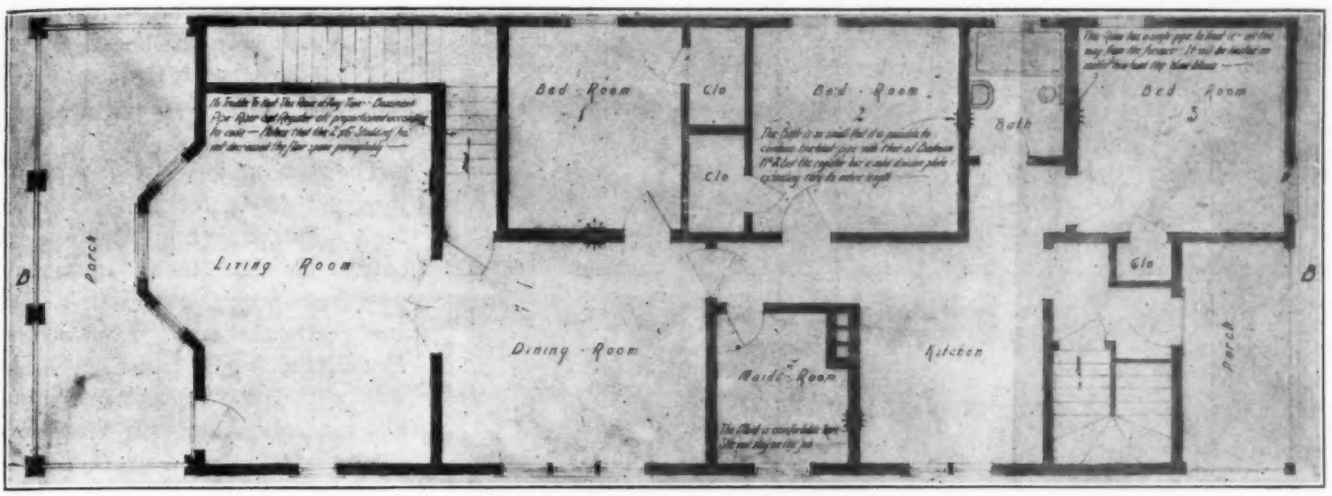
There has just been held at Utica a Better Homes Exhibit. The International Heater Company departed from the usual plan of simply exhibiting samples of their product by devoting a large part of their space to an educational campaign for better installation of warm air furnaces.

They took the "Standard Code for Regulating the Installation of Warm Air Furnaces" directly to the people themselves.

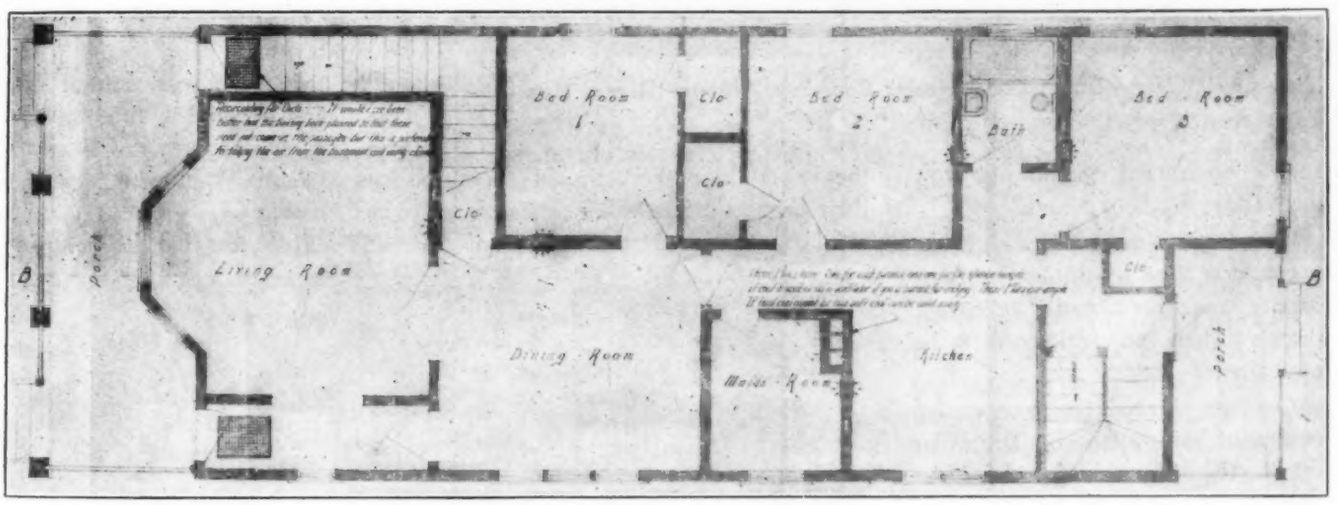
To do this they erected two furnaces, equipping them with pipes and registers.

One was set up as the bulk of the work is executed, not in Utica alone, but throughout the country where "hot air" work is done competitively.

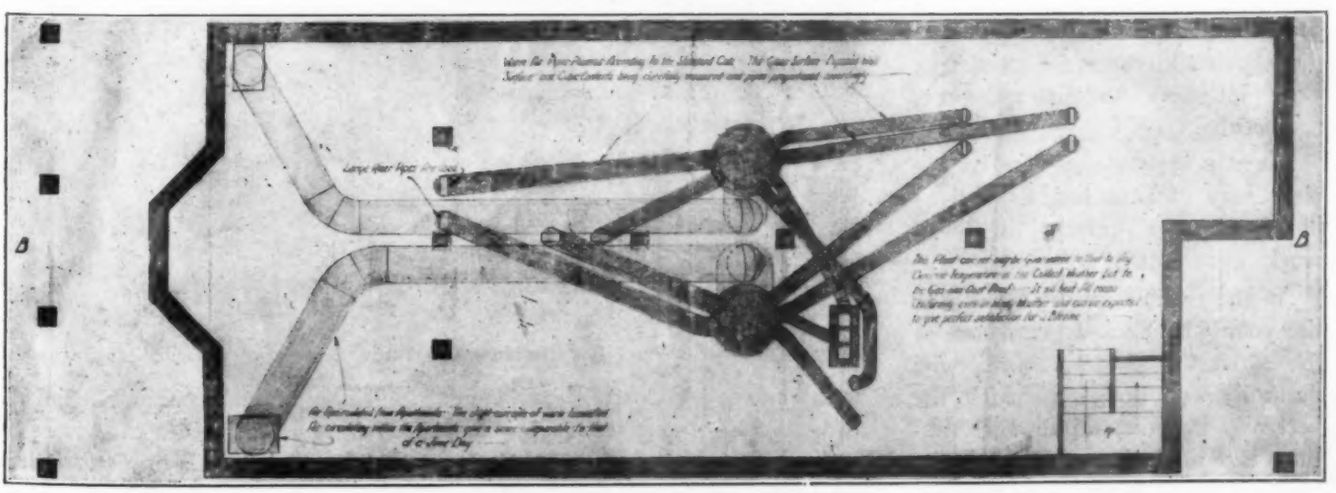
The return air was taken from the cellar, riser lines squeezed between so-called 2x4 studding with poor workmanship, and leaders covered with a single thickness of asbestos paper. The other heater was



Standard Code Layout for Second Floor.

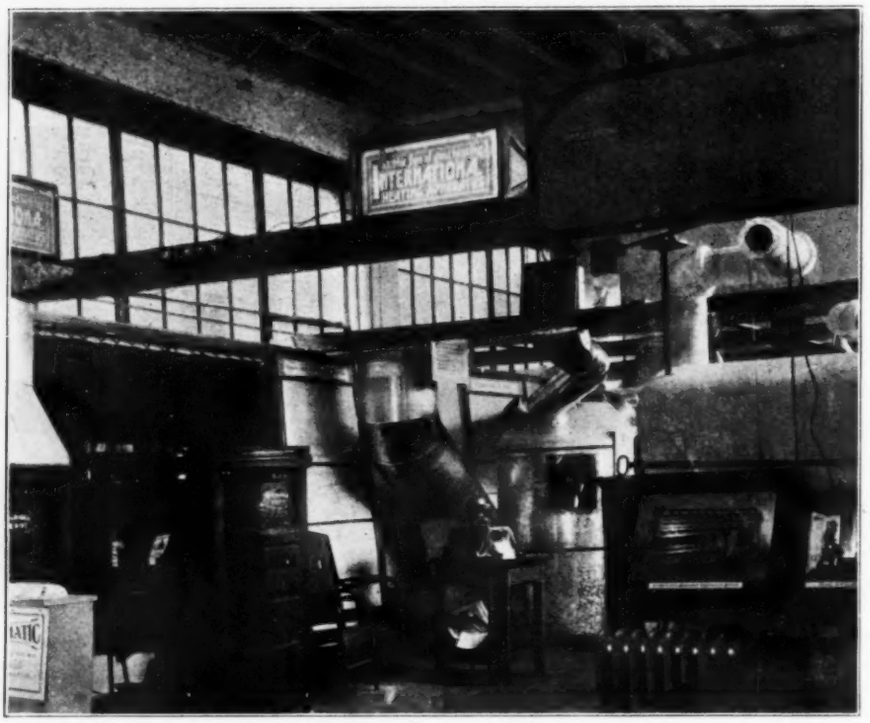


Standard Code Layout for First Floor.



Basement Layout According to Standard Code.

erected according to Code, pipes proportioned according to Article 3, collars carefully fitted, tin leader pipes left bare in basement, and the cold air recirculated through a carefully constructed galvanized iron duct from the floor above.



View of Exhibit of International Heater Company in Better Homes Exposition at Utica, New York.

Two large sets of plans showing a common type of duplex or two-family apartment were prepared, drawn to half-inch scale so as to be easily readable.

One set showed the competitive contractor's installation. The other set illustrated how the job should be done according to Standard Code.

Costs were figured and it was demonstrated that $50.00 covered the actual difference in erecting a Code job over the cheap, dirty, competitive type.

Large posters descriptive of the right way of planning, as well as illustrating the defects of cheap work, were posted.

As the exhibit was in charge of the young ladies and gentlemen of the Advertising Department, who naturally were not all versed in the best way to meet and answer questions that might be asked, especially by those whose homes were now unsatisfactorily warmed, a class was formed which was instructed how to demonstrate the exhibit. Emphasis was laid on the fact that the attendants were not there to try and sell heating apparatus, but to show the public how they should have their heaters erected.

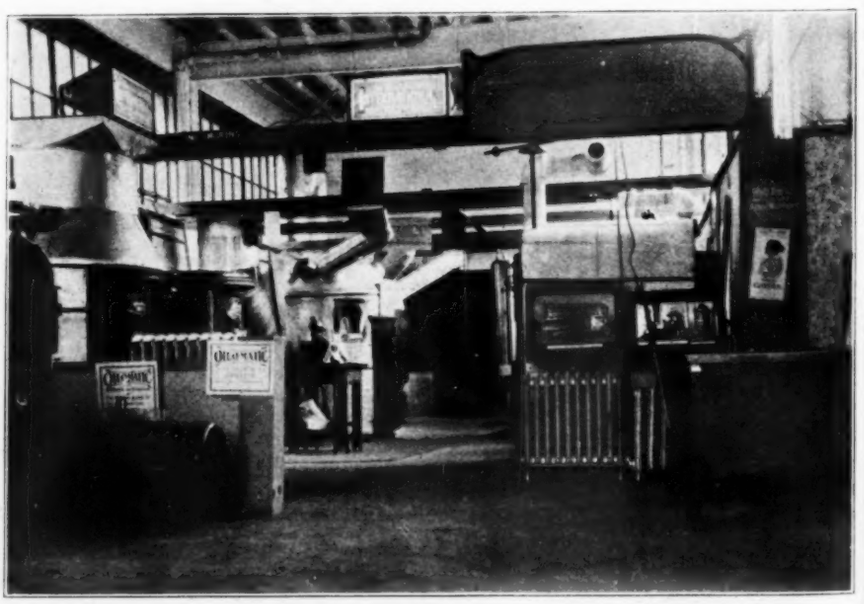
The interest aroused was universal, and many a home owner went away resolved to cease asking his family to breathe dirty cellar air in the future and convinced that when a warm air furnace was properly installed no heating system could be cleaner, more wholesome and more economical.

Another unique feature of the warm air exhibit was the offering of a prize for the oldest International (or any of its predecessors, Carton, Wheeler, Howard, Kernan, or Pease) furnace still in use. About fifty coupons were turned in. These have not all been checked and verified, but heaters of from thirty to thirty-five years of service are very common.

The International Heater Company did not center their efforts at the exhibit on Warm Air Heating only. To show their impartiality they had on exhibition both Round and Sectional Boilers, from a little Hot Water Supply Boiler connected with a 45-gallon copper tank, up to a seven and a half ton Smokeless Boiler rated at over 11,000 square feet of radiation. Two International Boilers, demonstrating oil burning apparatus, were shown in nearby booths.

The exhibition was a great success. It was visited by thousands of people, who went away with better ideas of home equipment and residence heating.

Mr. Carr states that the Company will be glad at any time to lend its aid to any individual who wishes to be assisted in preparing any similar exhibit or in furthering the adoption of the Standard Code.



Another View Showing Oil Burning Apparatus, Boilers and Warm Air Furnaces.

Engineers Discuss Motors for Ventilating Fans.

Problems connected with direct-connected motor-driven fans were discussed at the November meeting of the New York Section of the American Institute of Electrical Engineers, held November 14, in the Engineering Societies Building. Among the speakers were C. A. Booth, of the Buffalo Forge Company; F. R. Still, of the American Blower Company; C. F. Scott, of the General Electric Company; and J. L. Yardley, of the Westinghouse Electric & Manufacturing Company.

Mr. Still, after discussing the difficulties in connecting low-speed heating and ventilating fans directly to alternating-current motors, expressed the opinion that where alternating-current motors have to be used for that purpose, the best solution is belt drive from an alternating-current motor.

This view was endorsed by Mr. Booth. As usually applied for commercial work, there is no space limitation that is likely to prohibit the use of belt drive for fans. Belt drive, he said, is by far the most common arrangement for heating, ventilating and drying fans in factories, the pulley ratio averaging about 4 to 1.

Mr. Scott's paper was entitled, "The Application of Electric Motors to Blowers." Direct-current motors for blowers used in ventilating systems, he said, should be shunt wound. He also advocated belt or chain drive with alternating-current motors when driving slow-speed fans and emphasized the importance of width, thickness, number of piles, speed, etc., in the selection of belts. By choosing of the right chain speed and the proper pitch, angle and tightness, he said, chain drive can be made quiet. He spoke of a method of insuring quiet chain drive by incasing the chain and running it in oil.

Mr. Yardley's paper called attention to problems involved in applying motors to fans. The present tendency to increase normal fan speeds has materially increased the number of fan applications that may now be directly driven by electric motors. To meet all the conditions as to horse-power and speeds required in ventilating work, a wide variety of ratings of motors has become necessary, these ratings now running up into the thousands. He expected this condition to continue and foresaw a very general use of direct-connected variable speed direct-current motor drive for ventilating fans in schools and public buildings, and mentioned the item of cost as their only disadvantage.

The ensuing discussion brought out the need of closer coöperation between the fan and motor manufacturers so that motors of standard ratings and speed could be more generally utilized.

Proper
Heating
A well ventilated, properly heated home is absolutely necessary for the preservation of your family's health in cold weather.
Sunbeam Furnaces, sold and installed by me, will prove their worth in a very short time—both in saving coal and the proper distribution of heat and comfort.
J. C. Miller
Monticello, Illinois
Phone 125 Phone 125
Miller Appeals to Desire for Comfort and Economy.

Death Takes W. J. Haynes, Vice-President, Haynes-Langenberg Manufacturing Company.

We regret to announce to the many friends of the Haynes-Langenberg Manufacturing Company that William Johnson Haynes, Vice-president of this Company, passed away on Thursday, December 20th.

Read every page in this issue.

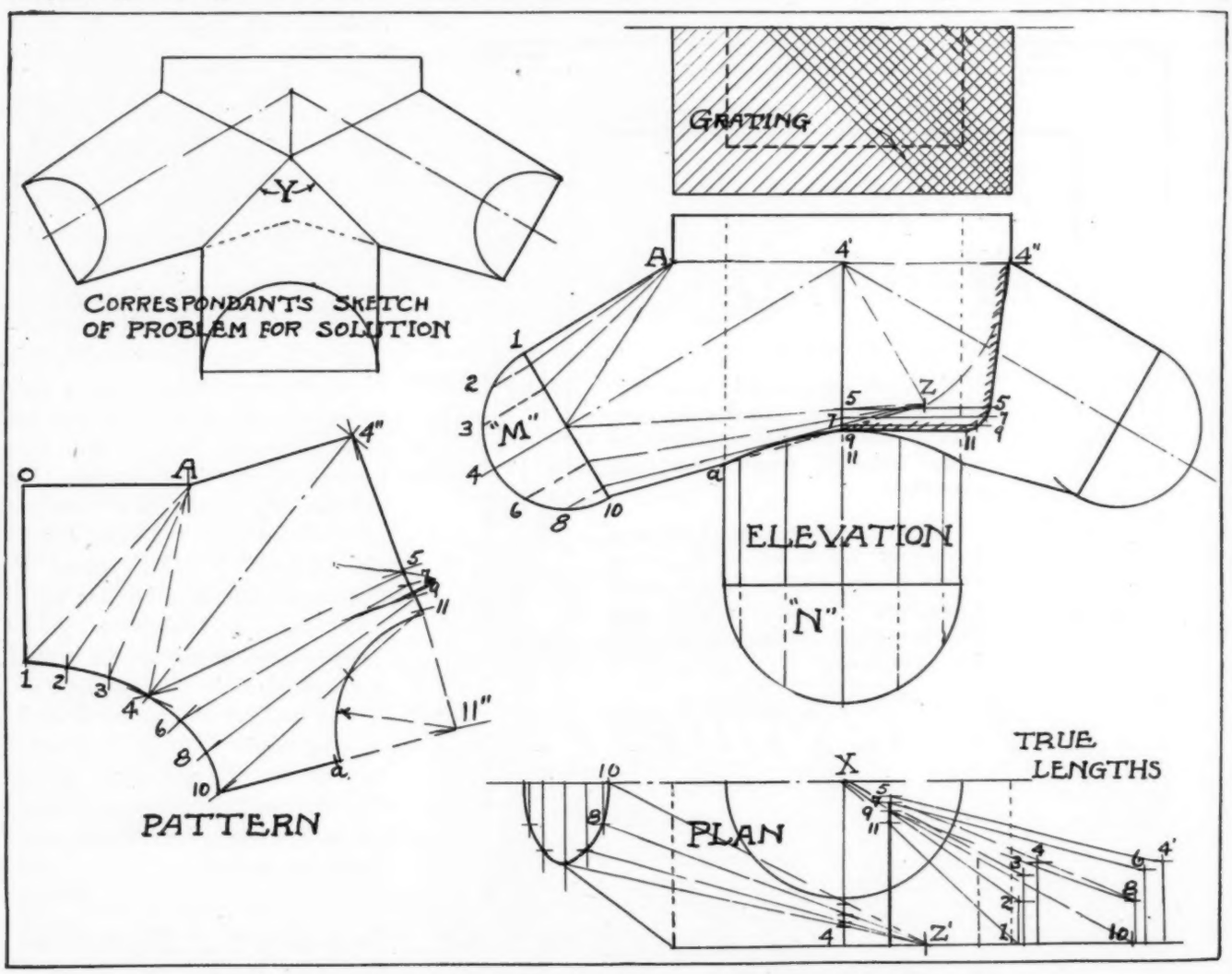
Furnace Installers Are Constantly Required to Make Furnace Hood Connections.

Pattern Shows Working Drawing of Furnace Hood Connections When Properly Fitted.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri.

A CORRESPONDENT sends in a sketch of a fitting he says does not work right, and he is unable to explain why the center tee does not fit properly. So the accompanying drawing shows a correction of the over-sight which the correspondent can paste in his book.

From the sketch of the correspondent, the lower vertical prong is for the warm air connection to the grating in the floor above, while the two side prongs are for the cold air return leading down from the grating to the ash pit connection. Now the miter line in the sketch shown by Y is quite incorrect, because of the diameter through this point. In observing our elevation we see a similar connection is made as the tee fitting on a large pipe of larger diameter. From the plan we see the difference that the Y branch spreads past the lower prong represented by the semi-circle. The general scheme is to have this center prong pass up through the branch as the dotted lines of elevation indicate. In fact, this portion shown dotted should be a double walled fitting so as to form a sort of vacuum and prevent the cold air returning from becoming tempered before it gets to the bottom of the furnace. This however, is a small matter in making a double pipe, as our problem is to make the layout and establish the opening between the side prongs to enable the warm air pipe in slipping through as shown. So we first draw the elevation to suit the size of the cold air



Working Drawing Shows How to Make Pattern for Furnace Hood Connection.

grating such as the register box placed in the floor would require. Then we draw the line A-4″ and from the center 4′ we draw the bevel lines to which the side prongs are to point. After this we describe the half section "M" and treat this prong as an ordinary Y branch which requires developing the true section through the middle shown shaded. By means of the part plan we get the half diameters on a line X-4 and set them as 5-5; 7-7; 9-9; 11-11. We should say that to enlarge the throat we take the radius 4′-4″ and describe it as Z-4′ which is at right angles to the axis 4-4′. This point Z then becomes the corner of an imaginary square to round from which lines are drawn to the base 1-10. To develop the pattern we must first set out the true lengths and this is shown in the diagram below where they are made the same as has been explained in these columns from time to time as well as in the book you speak of. To start the pattern draw any line as O-A which is equal to the width of plan X-4 for instance and then we make O-1 equal to A-1 of elevation. Next take line X-1 from true lengths and using A as center, see that it crosses in point 1. Set dividers to equal one of the sections "M" add 1-2 for instance and using point 1 as center, strike arcs as at 2. Then pick true length X-2 and using A as center, cross arcs in point 2. Continue in this way until point 4 is established and then set dividers to the half width or A-4′ of elevation then using A as center, strike arc as at 4″. Then take true length X-4′ and using point 4 in pattern as center, cross arcs in point 4″. After this pick the girth of true section 4″-5 and using 4″ in pattern as center, strike arc as at 5. Then pick the true length 4′-5 and using 4 in pattern as center, cross arcs in point 5. Repeat in this way until the points 10-11″ are established.

To describe the opening in this pattern, we pick the distance 10-a of elevation and set it in pattern as 10-a. Then take the radius of section "N" and see how that corresponds with the intersections in plan as the arc passes over Z′-10. If an approximate arc is cut off as shown, the opening is sufficiently accurate even though it is a little smaller than strict developments might produce. This saves further geometrical treatment and as an edge must be turned up anyhow, so a little more or a little less will not matter. If the workman desires greater accuracy, they can project the points where the arc in plan crosses the line Z′-10 into elevation of similar numbered line. Then by picking these points from the end 10 and setting them in true lengths and erecting lines to intersect lines of similar number as we show the dotted position Z′-1 intersecting the line 9-10 in true lengths. This line with its points can then be transferred into pattern as the line shows in the intersection of 10-11 in pattern.

Many Promotions and Changes of Positions Have Been Made in Armco Sales Organization.

Newbold L. Pierson, Jr., Becomes Detroit District Manager with R. L. Shugg as Assistant.

ON account of the acquisition of the Ashland, Kentucky, property by the American Rolling Mill Company, and the fact that the new mill there, which is now partially completed, will soon be in full operation, a number of changes will be made in the Armco sales organization.

W. W. Sebald, who was formerly Assistant General Manager of Sales, has been promoted to Assistant Vice President and he will assist the Vice President and General Manager, C. R. Hook, dealing with distribution problems.

R. C. Todd, District Manager of the Detroit Office, has been promoted to Mr. Sebald's former position, and will be Assistant General Manager of Sales.

The Detroit Office will be in charge of N. L. Pierson, Jr., as District Manager. This promotion comes after ten years' service in Detroit and Michigan.

R. L. Shugg, who has been Assistant District Manager in Cincinnati territory, has been promoted to Assistant District Manager in Detroit. "Mont" is the secretary of the Ohio Salesmen's Auxiliary. He is a good scout, and we hope that the Michigan sheet metal men will feel as kindly towards him as they do toward N. L., Jr.

E. M. Johnston, former District Manager in St. Louis, has severed his connections with the company and has become Vice President of a manufacturing plant in the east, through connections of his brother, who is Vice President of the Chemical National Bank, New York City.

D. E. Foley, better known as "Turk," formerly Assistant District Manager in Chicago, has been promoted to District Manager of the St. Louis Office.

The Cleveland interests of Armco have formerly been looked after by the H. D. Cushman Company. This arrangement is being discontinued and a district office being opened in Cleveland, in charge of R. L. Williams, as District Manager.

These various changes will become effective January 1st, and there are still a number of minor changes to be made, to be completed as soon as possible.

All of these changes came unexpectedly, and you may rest assured they are certainly appreciated by all of the boys.

We sometimes speak of winning a reputation as though that were the final goal. The truth is contrary to this. Reputation is a reward, to be sure, but it is really the beginning, not the end of endeavor. It should not be the signal for a let-down. but, rather, a reminder that the standards which won recognition can never again be lowered. From him who gives much—much is forever after expected.

Working With Angle Iron Is Coming Increasingly Into Use Among Sheet Metal Workers.

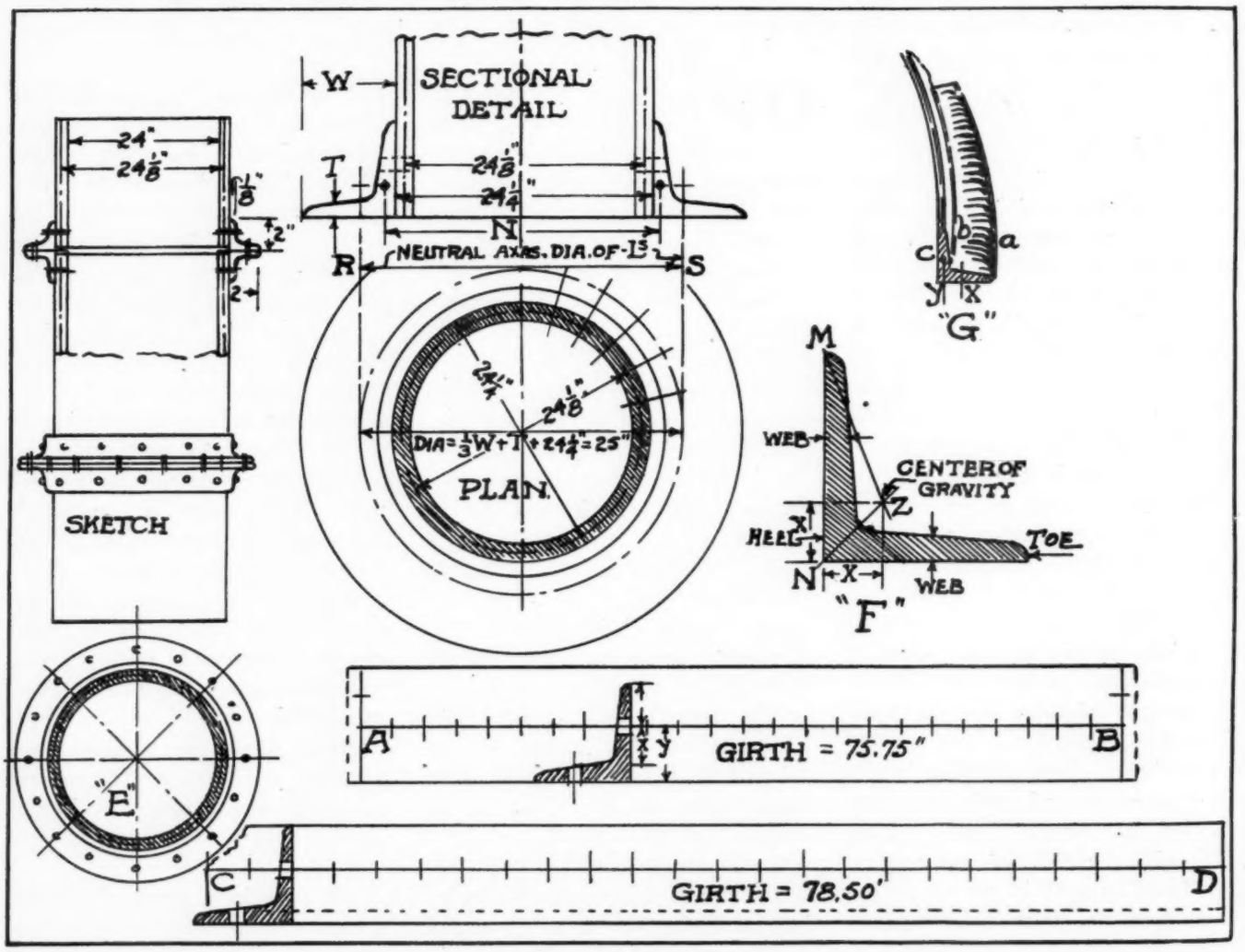
Pipes of the Larger Sizes Are Being Reinforced with Angle Irons as Shown by the Pattern.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by O. W. KOTHE, Principal, St. Louis Technical Institute, St. Louis, Missouri.

THE sheet metal trade is getting so that it has more and more to do with angle iron than ever before. Pipes, both round and square, are being made of larger sizes, which must be reinforced with angles, so that sheet metal shops of a progressive nature are equipping themselves with special angle shears, punches and rolls for working angles more proficiently. As it is, most workmen do not like them and worry themselves around in trying to shape them up, resulting in a considerable loss of time. The sheet metal shop seldom handles angles over 2½x2½ x¼-inch material. The most commonly met with is 2x2x⅛-inch.

Now, in using angles for square or rectangular pipes or tanks, as reinforcement means, it is a very simple procedure, but a different problem is met when it comes to cylindrical pipes or tanks. Here it is desired to roll the angles to as near their true lengths as possible, and to have them welded into hoops, so they can be slipped over the pipes and riveted in position. With angle irons there is a center of gravity the same as in every thickness of material, such as steel plates, planks, beams, bridges, ships, etc. It is this center of gravity that allows the angle to bend either way without changing its length. We of the trade call this the neutral axis line and is shown in our sectional detail by the distance R-S.

Now and then a workman feels that the distance N in the sectional detail is the proper diameter for figuring the dimensions of the angle. It is claimed that by stretching the web of the angle as at "G," the neu-



Working Detail for Angle Iron Jobs.

tral axis line is caused to rest in the line Y. Now, this cannot be true and will surely produce a shortened length or a hoop smaller in diameter than is actually required. Observe that in merely stretching the web and especially along the toe of angle "G" that does not perceptibly force the neutral axis line from X inward; especially that the throat c does not shrink so much and that little hammering is done in the valley b, while most of it is done along the toe a.

Folks who have worked in angle iron will bear this statement out that the neutral axis line does not move from X to Y by the process of hammering or stretching the toe of angle. It may have some effect in crowding the X line over toward Y a small fraction, but just what that would be no one ever knows.

There are several ways of determining this center of gravity; one method is shown by "F," where a section of the angle to be used is cut out of either tin or cardboard and marked as shown. Then the toe is picked up as at M and left to balance or right itself. By having a steel square, placed in a vertical position and made secure, this point M is laid against the edge of square and the line is marked. After this the angle section is picked by the corner M and left to balance, by which means the line M-Z is drawn. Where these intersect, as M-Z and N-Z, the center of gravity is established. By squaring lines back the distance X is what we should measure in determining the neutral axis line. This can be used in either angles of the same size or of webs having different lengths. Another method is to use this formula, which many boiler makers use and those who have had wide experience say they have never had any trouble with it:

DIA.=⅓ W plus T plus dia.

That means that the neutral axis diameter is approximately equal to ⅓ the width of the angle, plus the thickness of the web, plus the outside diameter of the shell to which the angle is to be fitted. In this case we have twenty-five inches as a neutral diameter R-S. In laying off the patterns for the shell of pipe or tank, we have the girth A-B, which is 75.75 inches long. The angle shown in position indicates where the rivet lines should be placed in relation to the heel of the angle. Now the angle bar that rolls around the shell will be as long as C-D, or 78.50 inches in circumference. When this is rolled, either by hammering or by forming around a stake by heating, or in rolling in the machine, an approximate accuracy is assured. Rivet holes may be set in as shown in the several lines and can be determined as in the plan by means of the radial lines. Still another method that is possibly more accurate from a theoretical standpoint is to use a Steel Company's handbook, where the angles are displayed in design and sizes, and then under the columns of X and Y the neutral axis measurements from the heel are given. These will be absolute measurements and do not take in the leeway met with in practice and which accounts for the approximate method we show to be accurate enough, since that allows for one ring of metal fitting around another one.

Lansing Sheet Metal Contractors Meet in Ward Office, December 18.

The regular monthly meeting of the Lansing Sheet Metal Contractors' Association was held in the office of E. H. Ward & Company, Tuesday evening, December 18th. After the regular routine of business was disposed of, committees for the State Convention made their reports on the progress of plans for entertainment of guests at the annual meeting. From these reports it is quite certain that no pains will be spared to make this the most enjoyable occasion ever arranged by a Michigan local.

On Wednesday evening, December 19th, a special meeting of the Saginaw Association was held to discuss plans for the advancement of the sale of Michigan Standard Sheets and Products. At this time it was decided to give Morley Brothers, Saginaw, the jobbing privilege for that section of the state. It was also decided to make this city a 100 per cent Michigan Standard locality.

A meeting of the Sheet Metal Dealers of the Thumb District of Michigan was held on Thursday night, December 20th, at Bad Axe, for the purpose of forming a district association. Arrangements for the meeting were made by W. W. Chalk, of the W. J. Burton Company, and secretary of the Michigan Auxiliary. His plans were complete and eight firms responded. Through the courtesy of Mr. Chalk and the Burton Company a fine chicken dinner was served at the Irwin Hotel. Following the meal, a blackboard demonstration of overhead costs was given by F. E. Ederle, who also outlined the benefits to be derived from the formation of a district association. At the conclusion of his talk a permanent organization was formed, with P. Schmalz, of Harbor Beach, as President, and George Lawrence, of Bad Axe, as Secretary-Treasurer.

Meetings will be held on call of the President.

It is planned to solicit memberships from all sheet metal men in this territory. The following were present: P. Schmalz and A. Brandow, of Harbor Beach; George Lawrence, of Bad Axe; J. A. Miller and W. H. McClean, of Pigeon; J. H. Bohnsack and A. E. Whitfield, of Cass City.

Whitney Metal Tool Company Is More Than Doubling Machine Shop Capacity.

The Whitney Metal Tool Company, Rockford, Illinois, is building a forty-foot addition to their factory, also adding another floor, which more than doubles their present machine shop capacity. After the addition is completed they will install several new automatic machines to take care of their increased business, as their ball bearing punches and shears are meeting with great success. The capacity of the

hardening department has already been doubled, as well as the stock room.

*How a Standing Seam Roof Can Be Quickly But Securely Laid.**

During a rush season it is oftentimes quite convenient to know of some method by which a galvanized iron roof, or black iron painted, can be laid quickly, yet secure a standing seam roof having all the nails covered, thus avoiding possibility of exposed nail holes working larger than the nail with leakage the result.

With the exception of a double seamed, standing seam roof the

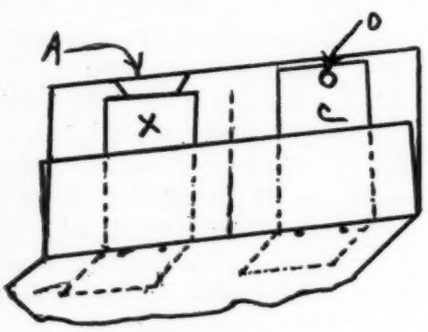


Figure 1.

actual holding point of contact of the anchor with the high flanges is at the end of the anchor. The folding of the high flange brings the anchor down and over the one inch flange, in its full strength, hence, if the end of the anchor is firmly engaged to the high flange, there will be no slipping, and if the two nails are driven through the anchor for securing same to the sheeting, close up to the bend, there will be no buckle or loosening of the roof during a high wind.

A comparatively heavy hand punch can be bought from almost any jobbing house; something after the style of an eyelet punch used by the shoemaker, but heavy enough to pierce roofing iron. Also short empty cartridges can be had from the same dealer; these two items are all that is necessary for the work, except the regular roofing tools on hand in every tin shop doing work of this character.

Rolls of metal can be bought from any corrugating works in either galvanized iron or black iron painted. If one of the methods herewith illustrated is preferred, to the plan used by the works for their own style of roofing seams, the rolls can be ordered plain without trimmings, cleats, caps, etc.

Two methods of cleating are illustrated by Figure 1. The manner of securing the anchor to the high flange with a cartridge, "O," is shown at "C" as having its open end, on the inside of the seam, with the result as shown by Figure 2, of bringing the closed, or solid, end of the cartridge to the front when the

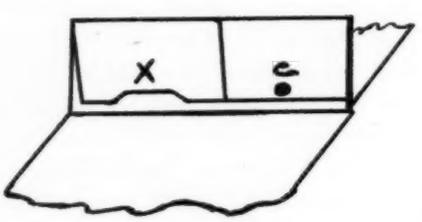


Figure 2.

high flange has been folded over the inch flange, presenting a solid, unbroken seam.

The open end of the cartridge, extending through the anchor, can be flanged open with a blunt punch when it can be cleated back upon the anchor. A safe seam, where sufficient pitch is given the roof. A more speedy plan can be used on sheds, or buildings where a really first class job is not justifiable, by having the anchor "X" engage the high flange, one-quarter inch from the top edge of the flange, by snipping in the flange, at a slant, as shown at "A" Figure 1. When this snipped portion is bent down and flattened over the end of the anchor, then the flange formed down to completion, it will finish as demonstrated at "X" Figure 2.

Cleat close and by either plan a good, safe metal roof can be laid with one fold of the flange, which covers the anchors and nails. I never have, and cannot conscientiously advocate any plan for metal roofing by which the standing seam is finished with a raw edge, nor where nail heads are exposed to the weather, however, such roofs are laid by the thousands every year, and after all is said and done, the longevity of an ordinary metal roof devolves to a considerable extent upon paint and the quality of this commodity, with the manner in which it is applied.

*Written especially for AMERICAN ARTISAN AND HARDWARE RECORD by L. S. Bonbrake, County Hospital, Peoria, Illinois.

Reduce Fire Hazard and Add to Your Annual Profits By Baling Waste Paper.

Somewhere down in the dark but venerable past some one has said that he who wastes waste, wastes a fortune. In going to work each morning I pass the rear of a hardware store and at which time I invariably see a boy emerge from the rear of the store with a basket of waste paper. Some mornings he has been before me and I then see the waste paper burning in the fire basket. Some days the basket which he carries is filled to overloading, others it does not contain so much. But each day he appears.

Now assuming that he does this six days a week and fifty-two weeks in a year, that will mean 312 times a year or roughly 300 baskets full of waste paper, allowing for holidays.

Baled waste paper sells at the rate of from 60 cents to $1 per hundred pounds. Why not bale it instead of burning it?

You will immediately say that you have no baler. Paper balers of the hand type are not expensive and even if the proceeds from the baled paper for the first six months or a year should be spent in paying for the baler, you are still accumulating capital in the form of a baler instead of burning the refuse which brings you nothing. After the first year the proceeds of the baled papers are clear profit. Then, too, the baler can be placed in some convenient inconspicuous corner of the store where it would be more handy than the fire basket in the yard, and the fire hazzard from flying sparks is eliminated.

Secretary Mooney Tells Ohio Sheet Metal Contractors What Auxiliary Is Helping to Do for Them.

The following letter has been mailed to 1,200 sheet metal contractors by George F. Mooney, Secretary of the Ohio State Association:

DEAR MR. SHEET METAL CONTRACTOR:

It will be a very great service to the sheet metal trade if you will give a conspicuous place on your office wall to the enclosed roster of The Jobbers' and Salesmen's Auxiliary to the Sheet Metal Contractors' Association of Ohio.

A conspicuous place is essential in order that you and your visiting salesmen lose none of the inspiration that lies in so imposing a list of men of brains and integrity who have dedicated themselves, in a big way, to the benefit of your industry as a whole.

The Auxiliary is a very valuable asset to the Ohio Association which is the organization that is collecting, co-ordinating and directing the mind and conscience of its industry to its own improvement and the public welfare and joining it to like bodies of other states to form a united whole that only will enable the sheet metal contractor to occupy the place he deserves in the world of affairs and esteem.

Substantial benefits are accruing to you from the efforts of the State and National associations and we would beg of you, give kindly consideration to our excellent ally, The Jobbers' and Salesmen's Auxiliary. We are, with sincerest interest

The Sheet Metal Contractors' Association of Ohio,
GEORGE F. MOONEY,
Secretary.

Make Sure You Understand Any Contract Before You Sign It.

Occasionally there comes to our desk for comment or criticism a contract which some obscure manufacturer or promoter wishes to have signed by a local merchant, for the "exclusive" sale of a product or service. The popular thing now seems to be a series of notes or trade acceptances attached to these contracts, which must also be executed along with the contract. There is usually embodied in the contract a series of almost impossible agreements on the part of the dealer—to furnish lists of prospects for indefinite periods, to permit factory salesmen to work in his territory, to surrender his rights if his coöperation is not active enough for the other fellow, etc., and to generally place his fortunes in the hands of the alleged manufacturer, under pain of cancellation of contract for various technical violations.

And on top of all this the "party of the first part" has the merchant's notes or acceptances before a piece of merchandise is shipped. If the goods are not as represented, the merchant has no redress, except to resist payment of the notes, and he usually pays rather than fight in court.

Merchants of reasonably good standing can buy all the goods they want to sell on 30 or 60-day terms. They don't have to sign acceptances in advance. They shouldn't sign them for strange concerns, and finally they should in any event be certain they understand not only what the salesman says the contract contains, but what is actually printed in it.

Notes and Queries

Sheet Copper and Brass.

From Waterloo Auto Radiator Manufacturing Company, 1810 East Fourth Street, Waterloo, Iowa.

Please advise us where we can purchase sheet copper ad brass.

Ans.—Merchant and Evans Company, 347 North Sheldon Street, Chicago, Illinois; American Brass Company, Kenosha, Wisconsin, and Milwaukee Corrugating Company, Milwaukee, Wisconsin. C. G. Hussey and Company, 212 North Jefferson Street, Chicago, Illinois, can furnish the copper only.

Electric Soldering Irons.

From N. C. Oxley, Greenfield, Ohio.

Can you advise me who makes electric soldering irons for use in radiator repair work?

Ans.—Rohne Electric Company, Minneapolis, Minnesota; Cutler-Hammer Manufacturing Company, 12th and St. Paul Streets, Milwaukee, Wisconsin; American Electrical Heater Company, 6125 Woodward Avenue, Detroit, Michigan; Ever Hot Manufacturing Company, 2222 West Lake Street, Chicago, Illinois, and Dover Manufacturing Company, Dover, Ohio.

Nickel Finished Nails.

From Apollo Metal Works, La Salle, Illinois.

Kindly inform us where we can buy nickel finished nails for fastening down "Apollo" Nickelzinc sheets.

Ans.—Lussky, White and Cooledge Company, 69 West Lake Street, Chicago, Illinois.

Oil Burners for Cook and Heating Stoves.

From W. W. Griffith, Gaithersburg, Montgomery County, Maryland.

Please tell me who manufactures coal oil burners for use in cook and heating stoves.

Ans.—Oliver Oil-Gas Burner Company, 7th and Market Streets, St. Louis, Missouri; Aetna Automatic Oil Burner, Incorporated, Providence, Rhode Island; American Oil Burner and Boiler Manufacturing Company, 3830 North Kilbourn Avenue, Chicago, Illinois; Tiffany Oil Burner Company, 200 Broadway, Paterson, New Jersey.

Oil Burners for Furnaces.

From United Hardware Company, 966 Elizabeth Street, Kenosha, Wisconsin.

We should like to know who makes oil burners for use in furnaces.

Ans.—Oliver Oil-Gas Burner Company, 7th and Market Streets, St. Louis, Missouri; Atlas Oil Burner Company, 5812 Broadway, Chicago, Illinois; American Oil Burner and Boiler Manufacturing Company, 3830 North Kilbourn Avenue, Chicago, Illinois; Nokol Company, 215 North Michigan Avenue, Chicago, Illinois; Tiffany Oil Burner Company, 200 Broadway, Paterson, New Jersey.

Spindles for Revolving Ventilators.

From Bangor Sheet Metal Works, Bangor, Wisconsin.

Who makes spindles or pivots for making revolving ventilators?

Ans.—Iwan Brothers, South Bend, Indiana.

Human Interest Feature Increases Window Display Pulling Power of Arndt Hardware, Blair, Nebraska.

Carpenters' Tools, Attractively Arranged, with Background of Workman in Characteristic Pose.

THE introduction of human interest into a window display is indeed a good practice, and where motion is supplied to the objects, the attention getting power is still further increased. Note the carpenter in the act of sawing a board seen through the open door of the work shop.

This arrangement is very cleverly worked out, and the Arndt Hardware, Blair, Nebraska, make the following remarks regarding the staging:

"Shelving on left hand side. Right hand side sloping back, but post prevents picture showing quite the full display, which is built up to balance left hand side.

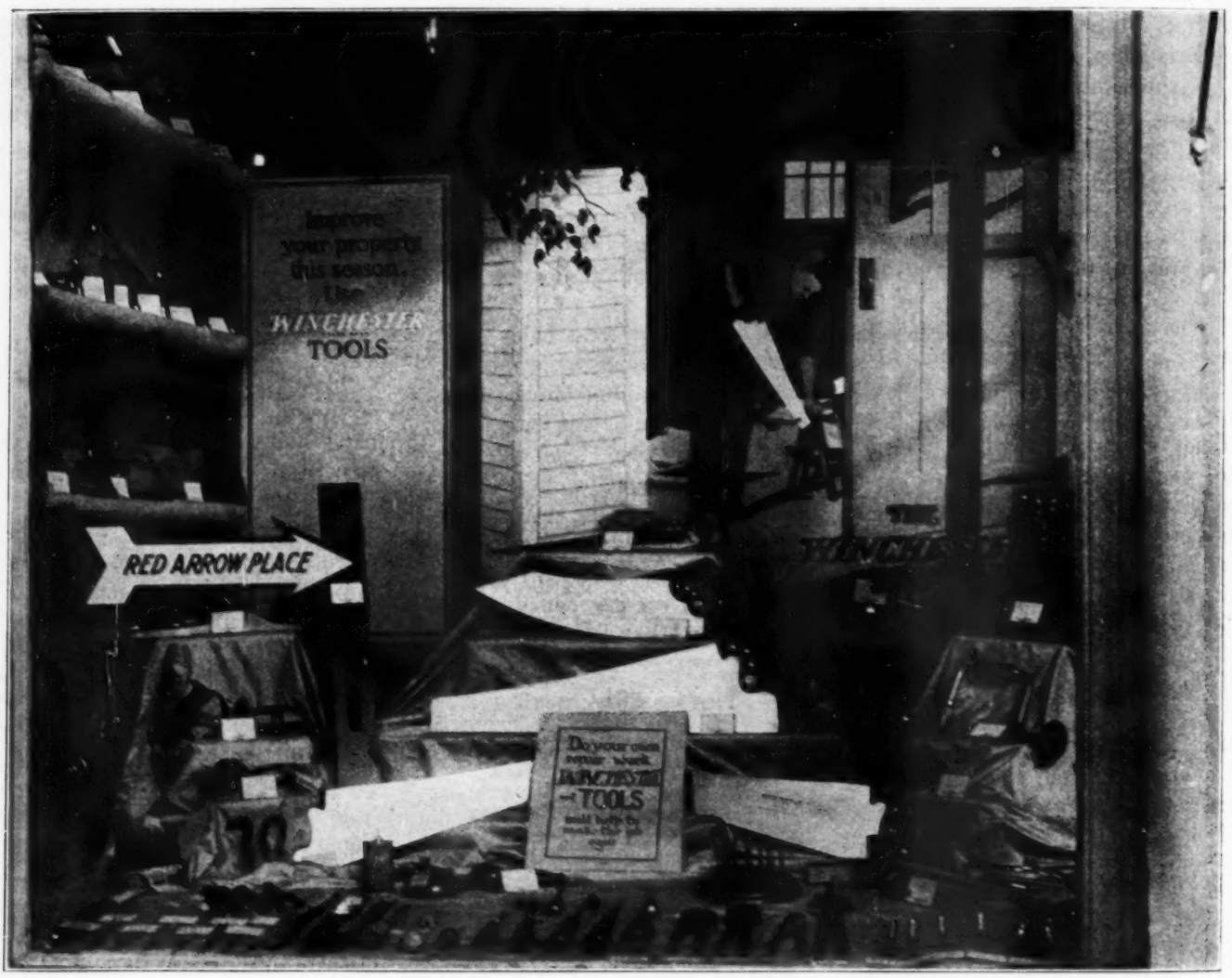
"The window is lighted with a "Beacon" dustless white bowl with a 200-watt Edison Mazda bulb in it, hung from ceiling about the center, which gives a pure white, soft light, does not hurt your eyes in trying to see the display, and does not cast shadows.

"The photographer cut off the top of picture, as the reflection of a building across the street shows so badly; and you will notice the black across the top is this reflection.

"The signs, 'The Winchester Store' and 'Red Arrow Place,' are on the glass. The background is a Winchester folding background in which we insert new heavy cardboards each week to suit the display.

"The pedestals are very simple, built up in a little time with boxes, etc., and laying boards across, different lengths and heights, etc., as you can see.

"Gray sateen (Winchester color) is used to cover the bottom of the



Window Display Showing Especial Originality on Part of Designer. Note Characteristic Pose of Workman Sawing Board. Display Made by Arndt Hardware, Blair, Nebraska.

window and drape over the pedestals, which brings out a neat appearance.

"Tools are featured, with quite large price tickets on each item, printed in blue ink, which did not photograph plainly. The price tickets lay in front of each small tool near front of window, except on top the files shown on left hand side.

"The saw with price ticket is partly cut off on left side. On the top shelf hatchets are shown, on second shelf hammers, and on first one hack saws and butcher saws.

"The sign in center was printed by one of the employes."

Hurry! Hurry!! Send in Your Window Display Photographs!!! Window Display Contest Closes January 12, 1924.

Pick Out Your Best Window Display Photograph and Mail It to Us Today—First Prize May Be Yours.

IDEAS for window displays are constantly coming up. The sight of a picture, a passage in a story or a remark overheard in a casual conversation will be the nucleus for a splendid window display.

However, the most efficient and productive method of getting ideas for window displays is to learn what other people in the same line of business as yourself are doing.

If you have one idea and you keep it to yourself you have always just that one idea. On the other hand, if you have an idea and you go among one hundred other men who also have one idea apiece, and who communicate their ideas to one another, each man still has his own idea, but in addition to that he has gained one hundred other ideas and he has lent his support toward helping his brother in some other town. None of these 101 men have lost a thing and each one has gained 100 other ideas.

Now, perhaps you will say that this is all true enough, but how can we get 100 men together for such a purpose?

It is for this very purpose that AMERICAN ARTISAN AND HARDWARE RECORD is conducting its window display competition and in order to get you to send in your best idea on the subject of window displays, we are giving you a chance to win one of the four prizes—$50, $25, $15, $10—which are being offered January 12, 1924, at which date the contest closes, for the best window display photograph submitted.

Do not delay in sending in your photographs. It means money to you whether you win a prize or not.

The following rules will govern the contest:

Rules Governing Contest.

The photograph, together with descriptions of how the window displays were arranged and the materials used, may be sent by mail or express, charges prepaid, and must reach this office not later than January 12, 1924.

Each photograph and description must be signed by a fictitious name or device and the same name or device must be placed within a sealed envelope containing the real name and address of the contestant. This sealed envelope is to be enclosed with the photograph. Contestants may enter as many window displays as they desire.

AMERICAN ARTISAN AND HARDWARE RECORD reserves the right to publish all photographs and descriptions submitted in this competition.

A competition committee of three will be appointed, one of whom will be an expert window dresser and one an experienced hardware man. This committee will pass upon the merits of all photographs and descriptions received, without knowing the names or addresses of the senders, and will decide the winners of the contest.

Old Guard Sends Holiday Greetings Through Secretary Boyd.

R. P. Boyd, Secretary-Treasurer of the Old Guard Southern Hardware Salesmen's Association, sends in the following bit of news and holiday greetings:

"You will be interested in knowing that our new members are:

"Leslie McDonald, 220 Claremont Avenue, Jersey City, New Jersey; Tillman Cavert, Stahlman Building, Nashville, Tennessee; William T. Bailey, Chattanooga Implement & Manufacturing Company, Chattanooga, Tennessee; John J. Gilmore, Brown-Marx Building, Birmingham, Alabama, and Thomas O. Parker, 249 Roberts Avenue, Glenside, Pennsylvania, giving us one hundred members, the full constitutional limit.

"Note the following changes in addresses:

"William M. Brezette, Columbian Club, Indianapolis, Indiana; George M. Carter, I. B. Williams & Son, Dover, New Hampshire; Arthur H. Deveney, Fourth National Bank Building, Atlanta, Georgia; Thomas H. Dickinson, Mason Hotel, Jacksonville, Florida; L. C. Frazer, R. F. D. 8, Box 70B, Birmingham, Alabama; Joseph H. Grubb, Haverford, Pennsylvania; G. B. Hobson, Long Coal Company, Richmond, Virginia; T. E. Parnell, 19 West Main Street, Chattanooga, Tennessee; F. Herbert Smith, Nicholson File Company, Providence, Rhode Island; J. P. Powell, The Chain Products Company, Cleveland, Ohio.

"The publication of the address of Mr. Ireland met with marked success. We have had numerous requests for extra copies and the Sparks Withington Company, of Jackson, Michigan, printed and distributed two thousand copies. Botticher-Kellogg Company, Evansville, Indiana, ordered twenty-five copies.

"Quite a number of our members were sick last summer, but happily all have recovered.

"Harry Beers is well and spry for a "youth" of 84 years. We enjoyed

a visit last week with Irby Bennett and were glad to see some improvement in him. His Christmas message to you is, Love to all you old boys and will see you in New Orleans at the next Convention.

"Uncle Charlie Forsyth is spending the winter in the West Indies. President Hugins, after a sojourn in Galveston, has returned to the Ranch, and the White House of the Old Guard is now at Meridian, Texas.

"Wishing you all a Merry Christmas and may the Lord take a liking to you, but leave you here awhile."

Why Not Establish a Sporting Goods Department in Your Retail Store?

Several Dealers Who Have Tried It Have Found It Profitable and a Means to Further Business.

MANY retail hardware dealers have found it very profitable to establish a sporting goods department in their stores. The facilities for the easy indulgence in all kinds of sports are more available now than they were heretofore. And a customer made in this line may be a prospect for sales in other lines later on.

In order to operate a sporting goods department successfully, it will be necessary for you to place a good, live clerk, who is well acquainted with the sporting world, in charge. If this is done, he will interest buyers in your line of goods by his personality; he will work up enthusiasm among the young men and boys about the town; he will organize teams, etc., and it will pay you well to allow this clerk to take a day off a week in order to play ball with a local school team. This clerk will keep up an active interest in sports and as the seasons change he will smooth the way for sales in athletic goods throughout the entire year.

If you want to make a success of sporting goods you should have a complete stock on hand ready to display as soon as the first signs of the season's opening appear. Give the displays as much space as possible and arrange them as attractively as your space will permit, and do not be afraid to ask advice along this line from the manufacturer whose line you are handling; he cannot afford to ignore your request. Do not confine your display to the window alone, but show the goods in the store as well.

A good plan would be to arrange an opening day, when a stock of the goods featured would be attractively arranged throughout the store. Advertising this day a week or two in advance cannot fail to attract the sport lover, as it arouses within him the impulse to engage in sports as a recreation when the warm weather comes on.

To hold the trade in sporting goods entails the devotion of considerable time to that department. A secret of success is to make that part of the store interesting to sporting goods customers. The sport devotee is first of all an enthusiast. If his interest is aroused on visits to the hardware store, he will keep on coming. A good stock will interest him. So will salespeople who know all about and are interested in the games that interest him. A salesman who can talk hunting to local nimrods, discuss the ways of the speckled beauties with angling devotees, and argue big league averages with baseball fans, will always be a magnet to attract trade.

Southern Jobbers to Hold Convention at Roosevelt Hotel, New Orleans, April 8 to 11.

Secretary-Treasurer Frederick D. Mitchell of American Hardware Manufacturers' Association has made the preliminary announcement of the Annual Convention of the Southern Hardware Jobbers' Association and the Spring Convention of the American Hardware Manufacturers' Association.

These conventions will be held at the Roosevelt Hotel, New Orleans, Louisiana, April 8 to 11, 1924.

Other hotels are the St. Charles and Bienville. Reservations should be made direct to the hotel.

One-Cent Article Pushes Advertising Appropriation to $6,798,662.

You, too, have doubtless wondered how the William Wrigley, Jr., Company, Chicago, can support a $7,000,000 advertising appropriation.

Well, the truth is, it doesn't; the advertising supports itself by increasing the number of sales.

There is no secret about it. Mr. Wrigley says so himself to the extent of $6,798,662 worth of advertising. The facts are there and they speak for themselves.

Advertising does pay and when properly directed there is no more effective means of retaining old customers and creating new business than by persistently advertising.

The example of advertising success mentioned heretofore could be duplicated many and many times, and when it is proved that so small an object as an article selling for one cent can be made to support an advertising appropriation of almost seven million dollars, what excuse have those articles selling for 75 cents, $1 or $5 for not supporting an advertising appropriation in proportion to that of the 1-cent article? The man who advertises gets the business.

An advertising appropriation is not an item of expense. Advertising increases the number of sales and thereby cuts down the selling cost of each item.

Are you sure that your store has proper ventilating facilities and that there is not that musty, stale odor about it encountered in so many stores? If your clerks look tired and worn out at the end of the day, perhaps the air is not what it should be.

Reverend R. Wagner, Byron, Nebraska, Takes Pictures for American Artisan.

C. F. Voss Puts on Unique Window Display Features During a Demonstration Week.

THERE appeared recently in AMERICAN ARTISAN some enlightening statistics on the annual advertising expenditure in the United States. From these figures we learned that $44,000,000 were spent each year on demonstrations and window displays.

Each year the merchants of small and medium-sized towns throughout the country hold demonstration weeks and live-wire merchants are continually making individual demonstrations. Many of these stores are furnished with the materials for the demonstration by the manufacturer or jobber whose goods the store handles.

The accompanying illustrations show two window displays of C. F. Voss, Byron, Nebraska, which were decorated by Fritz E. Voss, and they illustrate a collection of gasoline lanterns and supplies.

The photographs were taken at night by the Reverend R. Wagner, and the materials for the arrangement were supplied by the Coleman Lamp Company, Wichita, Kansas.

Excellently Arranged Window Display Demonstrating the Feature of Safety of Oil Lamps.

In order to demonstrate the safety feature of the lamp, an electric device was used to revolve the lamp slowly when in action, showing that there is no danger of a fire or explosion should the lamp be accidentally upset.

This demonstration proved successful in attracting many to the store and Mr. Voss says that he is now getting substantial results.

Voss Shows How Attractive Demonstration Can Be Made in Window at Small Cost.

Women Buy Many Cans of House Paint in a Year.

The tidy housewife or the grown up daughter with a feminine penchant for doing little, tasty things around the home, if she be not actually a faddist in this particular direction, is always in need of something in the paint line that the hardware dealer can supply. Her orderly soul and housewifely passion for cleanness will often lead her to make these little purchases at the store. Paint, varnish, brushes, enamels—they all come within the category of feminine wants, not only in connection with the annual spring housecleaning, but all the year round as necessity or feminine fancy dictate.

Philadelphia Hardware Exhibitors Don't Forget the New England Exhibit, Boston!

The attention of exhibitors at the Philadelphia Hardware Exhibition is called to the Annual New England Hardware Exhibition which will be held in the Mechanics' Building, Huntington Avenue, Boston, Massachusetts, February 20 to 22, 1924. Arrangements can be made to have the American Railway Express Company take the exhibits from Philadelphia on Friday night or Saturday previous to the opening of the New England Exhibit.

There are a number of good booths in the balcony and plans are being made to have the Radio Club of Boston demonstrate there, and Professor Dickinson, of the Massachusetts Agricultural College, Amherst, Massachusetts, will have charge of and demonstrate lawn mowers of different makes to the dealers, their clerks and to the public. A number of last year's exhibitors have taken booths in the balcony this year in preference to the floor to avoid the crowds.

The moving of exhibits between Philadelphia and Boston in other years has been satisfactory, as the

American Express has run a midnight special for the benefit of the exhibitors.

For further information kindly telegraph or write George A. Fiel, 10 High street, Boston, Massachusetts, Room 430.

Let Customer Handle Goods and Fix Desire for Possession By Touch.

Next to the sense of sight, the sense of touch provides the greatest opportunity for effective selling through actual demonstration. People will buy what they are able to *feel, touch, handle* and *examine* with far less argument than they will buy goods for which their sense of touch does not help to create a desire.

One of the first natural instincts of a baby is to reach; to grasp with tiny hands any object—its rattle, a bright colored piece of string or a glistening pair of scissors. It wants to feel, to touch, to handle. The baby's desire to possess is developed by the "feeling" of the objects it handles. *That is an instinct that is never outgrown.*

Purchasing desire—first aroused by a demonstration that attracts, satisfies and delights the eye—is made permanent by this gratifying of the sense of touch. A sale half made by letting the customer see the article in full performance is closed and the desire for possession completed when the customer has operated the article himself.

The more selling helps used in the way of display equipment, the more goods sell themselves, which means a reduction in salesmanship expense.

Coming Conventions

Western Retail Implement and Hardware Association, Missouri Theater Building, Kansas City, January 15, 16, 17, 1924. H. J. Hodge, Secretary-Treasurer, Abilene, Kansas.

The West Virginia Retail Hardware Association Convention and Exhibit, Huntington, West Virginia, January 15 to 18, 1924. James B. Carson, Secretary-Treasurer, 1001 Schwind Building, Dayton, Ohio.

Mountain States Hardware and Implement Association Convention, City Auditorium, Denver, Colorado, January 22-24, 1924. W. W. McAlister, Secretary-Treasurer, Boulder, Colorado.

Kentucky Hardware and Implement Association, Louisville, January 22-25, 1924. J. M. Stone, Secretary-Treasurer, 202 Republic Building, Louisville.

Sheet Metal Contractors' Association of Indiana, Hotel Severin, Indianapolis, January 29 and 30. Leslie W. Beach, Richmond, Indiana, is Secretary.

Indiana Retail Hardware Association, Inc., Convention and Exhibition, Cadle Tabernacle, January 29, 30, 31, February 1, 1924. G. F. Sheely, Secretary, Argos.

Nebraska Retail Hardware Association, Lincoln, Nebraska, February 5 to 8, 1924. George H. Dietz, Lincoln Nebraska, Secretary-Treasurer.

Wisconsin Retail Hardware Association Convention and Exhibition, Milwaukee Auditorium, February 6, 7, 8, 1924. George W. Kornely, Manager of Exhibits, 1476 Green Bay Avenue, Milwaukee. P. J. Jacobs, Secretary-Treasurer, Stevens Point.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 12, 13, 14, 1924. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Iowa Retail Hardware Association, Des Moines, Iowa, February 12, 13, 14 and 15, 1924. A. R. Sale, Secretary-Treasurer, Mason City, Iowa.

The Pennsylvania and Atlantic Seaboard Hardware Association, Incorporated, Convention and Exhibition at the Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14 and 15, 1924. Sharon E. Jones, Secretary-Treasurer, Wesley Building, Philadelphia.

Illinois Retail Hardware Association, Hotel Sherman, Chicago, Illinois, February 18 and 19, 1924. Leon D. Nish Secretary-Treasurer, Elgin, Illinois.

Ohio Hardware Association, Convention and Exhibition, Cincinnati, Ohio, February 19, 20, 21 and 22, 1924. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

New York Retail Hardware Association Convention and Exhibition, February 19, 20, 21, 22, 1924. Headquarters, McAlpin Hotel, and exhibition at Seventy-first Regiment Armory. John B. Foley, Secretary, 412-413 City Bank Building, Syracuse, New York.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, February 20, 21, 22, 1924. George A. Field, Secretary, 10 High Street, Boston, Massachusetts.

North Dakota Retail Hardware Association Convention and Exhibition, Municipal Auditorium, Fargo, February 20, 21, 22, 1924. C. N. Barnes, Secretary, Grand Forks.

Michigan Sheet Metal and Roofing Contractors' Association, February 25 to 28, 1924, Hotel Kerns, Lansing. T. E. Ederle, Secretary, 1121 Franklin Street, S. E., Grand Rapids, Michigan.

Missouri Retail Hardware Association Convention and Exhibition, Marquette Hotel, St. Louis, February 26, 27 and 28, 1924. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis.

Minnesota Retail Hardware Association Convention and Exposition, St. Paul Auditorium, February 26, 27, 28, 29, 1924. C. H. Casey, Secretary, Jordan, Minnesota.

California Retail Hardware Implement Association Convention and Exhibition, Civic Auditorium, San Francisco, March 18, 19, 20, 21, 22, 1924. LeRoy Smith, Treasurer, 112 Market Street, San Francisco.

Southeastern Retail Hardware and Implement Association, composed of Alabama, Florida, Georgia and Tennessee, Convention and Exhibition, Atlanta, Georgia, May 27, 28, 29, 1924. Walter Harlan, Secretary, 701 Grand Theater Building, Atlanta.

Hardware Association of the Carolinas Convention, Wrightsville Beach, North Carolina, June 17, 18, 19, 1924. T. W. Dixon, Secretary-Treasurer, 717-718 Commercial Bank Building, Charlotte, North Carolina.

South Dakota Retail Hardware Association and Exposition, Coliseum Building, Sioux Falls, March 4, 5, 6, 7, 1924. C. H. Casey, Secretary, Jordan, Minnesota.

Retail Hardware Doings

Arizona.

George O. Ford has opened a hardware store on East Washington Street, Phoenix.

California.

Dick Pira is going to open a hardware store at Madera.

Illinois.

W. V. McKinstry, one of Delavan's oldest business men in point of years in business, has sold his hardware and implement business to Louis Heckman.

Iowa.

Fire caused a loss of from between $500 and $1,000 to the hardware stock of Lenoch and Cile, at Iowa City.

Al Cocklin, of Washington, has traded his 100-acre farm near Washington to the State Bank for the Corley Hardware stock, the Corley residence and the L. E. White dry goods stock. Mr. Cocklin is closing out the dry goods stock and will move to Brighton in January to continue in the hardware business.

Oregon.

The Skala Hardware Company have moved to La Grande, and will open a hardware store at that place.

Taylor Hardware Company, Tacoma, have increased their stock from $3,000 to $6,000 and have changed their name to the Service Hardware Company.

Texas.

Texas City will have a new hardware store soon. H. M. Tarpey, a Texas City man, will be connected with Mr. Morley of Birmingham, Alabama.

Utah.

A new hardware store has started in business at Cedar City.

Washington.

J. Allen Oliver has purchased an established hardware business in Kent.

Wisconsin.

On January 1st the Droeger Hardware Company and N. Uttormark and Son, hardware concerns in Seymour, are going to merge their businesses under the name of the Seymour Hardware Company.

Henry Heyer is now sole owner of the Walworth Hardware store at Walworth, having purchased it from August Krueger.

Lauriston Makes Several Practical Suggestions for Boosting Stove Sales During January.

Rather Than Cutting the Price on a Range, He Would Offer Some Special Article in the Bargain.

VICTOR LAURISTON, who writes regularly for the *Michigan Tradesman* on hardware selling has the following suggestions to make for the month of January, with particular reference to the stove department:

Even while the wide-awake hardware dealer is meeting the heavy demands of the Christmas rush, he is also looking forward to the slack period that immediately follows the Christmas holiday, and planning to make the best possible use of that period.

Of course, it is a good time for the necessary clean-up of the disorder into which the stock has been thrown during the busy season. It may be desirable to put on a hastily arranged after-Christmas sale, with a view to clearing out the odds and ends of stock which it is preferable not to carry over to another season. A little later, with the new year, will come time for the annual inventory, and this will keep the merchant fairly busy.

But with all these matters to engross his attention, every merchant is none the less anxious to sell everything he can, at this particular period when trade is normally slack. The season is one which calls for extra effort if sales are to be made at all.

In this connection, the hardware dealer is apt to quite disregard the possibilities of his stove stock. The stoves have been pushed into the background to make room for Christmas lines, and the tendency in most stores is to leave the stoves in the background.

Many dealers take the view that stoves can't be sold right after Christmas. Yet there are hardware dealers who have conducted very successful stove sales in the early months of winter.

Here is a point worth remembering. Though most stove prospects have by this time concluded to worry through the winter with the old range or heater, the real worry for them is just commencing. At New Year's, perhaps earlier, the heater in particular is subjected to a heavy pull. Any spell of severe weather is pretty certain to show up its deficiencies, particularly in comparison with the new model the hardware dealer has been trying to sell.

Here is the psychological moment for the aggressive hardware dealer to push his line. "Why go through an uncomfortable winter with an old stove? You mean to buy a new one anyway for next winter. Why not buy now on easy terms, and get the benefit now? " This is the line of argument that will appeal to a lot of people with a growing grudge against the old heater that "falls down" when it is most needed.

Stock-taking is as necessary in the stove department as anywhere else in the hardware store. The stove inventory is, however, easy to take; and, if taken immediately after the holiday, it affords the pretext for a stock-taking sale in which stoves can be effectively featured. Indeed, a pre-inventory stove sale is often a good stunt. It will not seriously interfere with the stock-taking, for in most instances the merchant can take stock almost at a glance. There is no dead stock in the stove department. No hardware dealer worthy of the name will allow a range or heater to remain in stock until it is out of date.

At this particular season it is often found advantageous to offer special inducements to interest customers in stoves and ranges. Price is, of course, always an appealing feature. The fact should be carefully emphasized, that these special prices are for the month of January only—this to guard against "comebacks" when the regular stove season comes again and the dealer offers his lines at regular prices.

But price-shading is not the best way, in most cases, to interest customers. Many dealers have found it a better scheme to offer combinations which permit, ostensibly at least, the maintenance of the regular price. Thus, at the January stove sale, each stove purchaser will receive a razor, a lamp, a carving knife, or some other article of hardware of sufficient value to serve as an inducement.

It is almost always possible to secure the necessary premiums by going over the stock and selecting articles which, while still good value, have been in stock for some time, and which, normally, the hardware dealer at this time of year would have to offer at special prices.

Of course, there are many cases where, even at the height of the Christmas season, dealers do not allow their stoves to drop entirely out of sight. Some dealers advertise stoves and ranges along with Christmas gift lines; salespeople suggest them when comparatively expensive gifts are desired, and occasionally sales are made in this way while the season is in progress.

Where this has been done, the mind of the prospective customer is in some measure prepared for the stove sale immediately following the Christmas season. It will in any even be easier to awaken public interest than where the stove stock has been allowed to drop completely out of sight.

The minute the holiday season is ended, the stoves should be brought to the front and aggressively advertised. They should be featured in a window display. The selling campaign must be energetic, since it is usually advisable to time the sale so that it will be over before the big drive of the January stock-taking starts, about the middle of the month.

The featuring of stoves, however, does not mean that stoves should be exclusively featured. This is far from desirable. Where there is one chance of selling a stove or range,

there are scores of chances of selling kitchen utensils. The customer attracted by stoves can be interested in kitchen utensils, and it is sometimes the case that the customer who comes to buy a frying pan or a colander will finish by purchasing a kitchen range. The two lines fit in admirably together; the one appeals to the big money, while the other caters to the small spenders.

The stoves have this advantage, that they harmonize thoroughly with the household goods. They supply a sort of background to the display of small wares, just as Christmas decorations in red and green form a background for the gift lines featured in December. A display featuring a modern range as a center of attraction and a complete line of household accessories in connection will have greater pulling power than a range displayed by itself, a line of stoves alone, or a display devoted solely to kitchen utensils. By linking the two lines, you help the sale of household goods without diminishing in the least your chance of selling the stoves.

Excellent displays can be devised that will do a lot to stimulate after-holiday trade. With heaters, a model living room can be shown—the heater in the foreground, an electric reading lamp, an electric foot warmer if necessary, a chafing dish, and convenient accessories of one sort and another. A model kitchen will show, not merely the up-to-date range, but a complete line of kitchen utensils. By displaying these in a kitchen cabinet, the latter can be advertised as well.

Such displays not merely bring in some business at the time, but they have an educative quality. The educational side can be stimulated by demonstrations. The dealer has plenty of time to make these displays and demonstrations attain the maximum of effectiveness. It is a quiet season, normally; all the more reason why the dealer should put his very best efforts into his displays and demonstrations, designed to interest the public, and into his selling whenever he gets prospects inside the store.

Unique Oil Stove Special Put on By an Ohio Merchant.

J. C. Fetzer, of Wooster, Ohio, has devised a unique scheme of running a special oil stove sale to move out his stock. At the same time he checks up on his advertising to see whether or not his ad is being read.

Instead of marking down the original price of the stove and then mentioning the discount allowed, he simply says the ad entitles the holder to a $4 credit on any oil stove in the house. The $4 credit looks larger when stated this way than the other way.

Wherever this method of advertising a special has been in vogue, it has generally proved a success. It is often used at the end of the season when there are a few articles left over which the advertiser wishes to move out rather than store.

The offer of a credit is just another way of saying that a discount is being offered.

There are instances on record where the purchaser was actually given the credit in money. In this way he is brought to believe he is getting something for nothing, whereas he first pays the full purchase price and then collects his discount at another desk. These "wrinkles" are all good if they are not overdone. If worked with too great a frequency, however, the novelty wears off and they lose their force. The ad appeared in the *Wooster, Ohio, Record.*

Oil Stove
Special
This ad entitles you to
$4.00 Credit
on any oil stove in the house. Two Red Star Stoves, nearly new, taken in exchange, included. Come quick; we only have six oil stoves left.
J. C. FETZER, Hardware
143 S. Market St.
Phone 183

J. C. Fetzer Put on Oil Stove Special, Offering a Credit Instead of the Regular Discount.

Coulter & Proctor Stove, Peoria, Plans $40,000 Structure.

Coulter & Proctor Stove Company plans a $40,000, 4-story, 150 by 200-foot building to replace that recently damaged by fire.

Every page in this issue is worthy of your careful study.

Take Advantage of All Local Happenings with News Value in Your Advertisements.

Hatfield Stores, Washington, Indiana, Complimented on Their Distinctive and Unusually Clever Advertisements.

THERE are four consecutive objects which every advertisement must accomplish if it serves its purpose. First, it must attract attention; secondly, it must create interest in the goods offered; thirdly, it must convince its reader to the utility value of the advertised goods; fourthly, it must persuade him to act immediately and favorably to the advertiser.

This in general is the fundamental object of all advertising.

In response to the appeal for specimen advertisements by the Ad-Critique Department, W. B. Allen, Advertising Manager of the Hatfield Stores, Washington, Indiana, has submitted two specimens of the store's advertising.

Mr. Allen says that the store advertisement retains the same position in the local newspapers constantly and it is changed daily.

The cut seen in the upper right hand corner is found in all of the store ads. The head line is con-

OUR OFFICE CAT SAYS
Chief Neal is thinking of pinching some Fords around town for indecent exposure. Better put a coat of B. & V. Finish on em.
Bradley & Vrooman Auto Finish
is made for the man who likes to "do for himself." The skill is all in the can. With this finish you can paint your car yourself.
All Kinds of Top Dressing
HATFIELD STORES

stantly changed. It will be noted that this little verse which makes up the head line always turns the reader's thought to the object advertised; it acts as a switch to divert the reader's thought from the local interest which has attracted his attention to the offering being made by the store.

It will be seen that prices are quoted in one of the ads and not in the other. Mr. Allen says that the store never quotes prices in the ad unless they are offering a special sale.

"The idea in this type of advertising," said Mr. Allen, "is to produce an ad that is different from

OUR OFFICE CAT SAYS
Your wife can keep you in hot water if you do, and she ought to keep you in hot water if you don't get her one of these tea kettles.
Aluminum Tea Kettle Special
$1.98
Actually, we are selling a No. 8 size Aluminum Tea Kettle for $1.98, but not for long they are going fast.
"You'll have to hurry."
HATFIELD STORES

any other in the paper, and we take advantage of every local happening that has news value to further our purpose."

He also says that they have received many compliments on their ads and that the latter have been very productive of results.

Send your specimen advertisements to the Ad-Critique Department of AMERICAN ARTISAN.

* * *

Thursday, November 29, is the day on which we give thanks to God for the many blessings he has showered upon us. Rather a peculiar way of showing our gratitude by gourging ourselves beyond all capacity with rich foods; but, nevertheless, such is the custom established by our forefathers back in 1620 or thereabouts, and far be it from us to disregard an excellent opportunity to do some forceful advertising.

The accompanying advertisement is reprinted from the *Gainesville, Florida, Sun*. This ad shows how the Baird Hardware Company advertises for the Thanksgiving holiday. A few words suggestive of the autumn festival, together with an illustration of a gobbler and the name plate. This ad illustrates an excellent typographical arrangement and a judicious use of white space.

More Improvement in Market; Congress Votes Tax Bill Right of Way Over Bonus.

Trading in Non-Ferrous Metals Quiet—Little Change in Prices, Except Tin—Zinc Easy.

VOLUNTARY control of business conditions next year can nowhere be exercised so immediately and directly as in the decision to be taken by Congress regarding tax reduction or a soldiers' bonus.

Treasury statistics showing the extent that taxes may be reduced, if the bonus be discarded, at once aroused hearty acclaim in all parts of the country.

No argument is needed to show that all business would benefit from a lightening of the supertax burden, through lessening the inducement to invest in tax-free securities.

The quickening effect of this additional current of capital, which would flow into business investment channels, might make itself felt almost at once upon a widening circle of industries.

Out of 14,000,000 taxpayers, over 13,124,000, or 93 per cent, have annual incomes of less than $6,000.

Any relief in the taxes imposed upon this large group would doubtless reflect an immediate improvement in purchasing power that would in turn give a considerable and continuing stimulus to the country's volume of trade.

Copper.

Electrolytic copper is available from producers at 13.12½ cents delivered for shipment over the next two or three months and some of the smaller producers are ready to sell at 13.00 cents delivered.

Few, if any, of the larger producers expect to obtain over 13.12½ cents delivered in the near future, although some are nominally asking 13.25 cents delivered.

There is still some misgiving as to the future functioning of the Copper Export Association, according to rumors in the trade, but large interests are hopeful of harmonizing differences among various selling interests and thus keep the Association intact.

Tin.

The tin market has been in a confused state this week, and after experiencing several changes from strength to weakness and weakness to strength, closes in a quiet condition, with prices about one cent per pound above the lowest.

The market has ranged between 46.25 cents and 47.75 cents for Straits tin the past week, with considerable professional trading, but little consuming buying. While it is expected December will show some increase in the world visible, the American visible stocks are expected to be less than 1,000 tons December 31. Consequently there has been a tendency to ask a premium for January deliveries.

Lead.

The easier conditions witnessed a few days ago in the lead market have once again given place to a firmer tone, and it is becoming obvious that such anticipations as were held in some parts of the market that the position would become a little less stringent as the month wore on, are likely to be disappointed.

It is true that consumers are buying on a less insistent scale, but nevertheless demand is still well able to take care of current output, and world production apparently will have to expand to a considerable degree yet before equilibrium is reached.

Lead quotations at St. Louis are as follows: Prompt, 7.70 to 7.80 cents; December, 7.70 to 7.80 cents; January, 7.65 to 7.75 cents; February, 7.40 to 7.60 cents.

Zinc.

Zinc reacted to 6.15 cents, East St. Louis, for prompt shipment, then recovered to 6.25 cents, with improved buying by galvanizers for early first quarter.

The strength of the Joplin ore market at $41 is preventing much price reduction in slab zinc.

An insignificant amount of zinc export business was done the past week, the London market being generally too low to be attractive.

Solder.

Chicago warehouse prices on solder are as follows: Warranted, 50-50, $30.75; Commercial, 45-55, $30.00, and Plumbers', $28.75, all per 100 pounds.

Wire and Nails.

Jobber customers of wire products makers have been active of late in placing their 60-day contracts for mixed and straight carloads.

Manufacturers likewise have been busily engaged placing contracts for first quarter requirements. Consequently the aggregate sale of wire and wire nails has been heavy, including large lots of small nails.

A fair amount of fencing business has been booked in recent weeks.

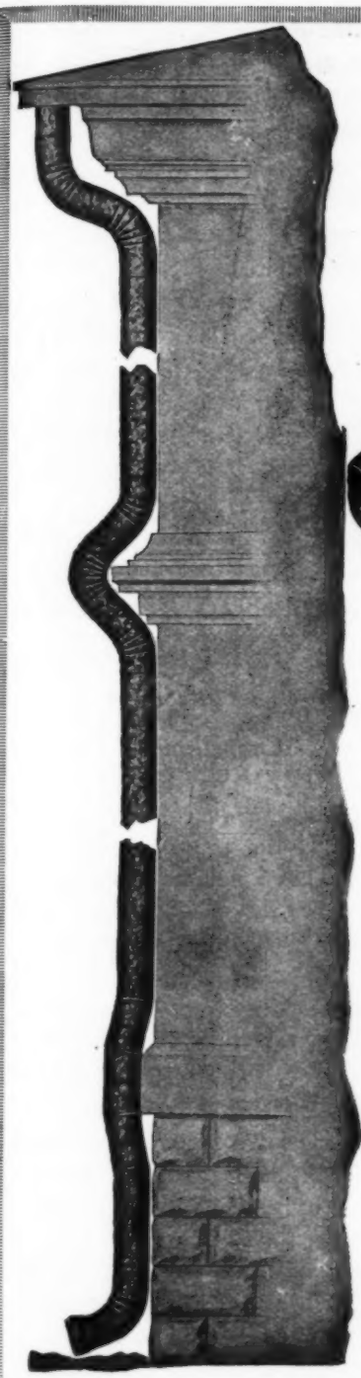
Operations among wire products makers continue to average 70 to 75 per cent of capacity, but mill stocks are only 20 per cent of normal for this time of year when spring business is about to be faced.

No stocks of small nails are available and makers have been able to accumulate only meager stocks of larger sizes.

Prices are unchanged on the basis of 2.75 cents, base Pittsburgh, for plain wire and 3.00 cents, base Pittsburgh, for nails.

Bolts and Nuts.

Shipments of nuts, bolts and rivets are light, since most of the business in the hands of makers here is for shipment after January 1 to apply on contracts recently booked for first quarter requirements of jobbers and users. These contracts



Illustrations show elbows of all angles from 10 to 90°. Note how close each cluster of elbows hugs the walls.

Use short angle elbows to get around sills, cornice mouldings and all other projections, thus preventing the commonly known soldered break in the pipe.

By using c ombinations of this kind, soldering is not necessary as elbows fit into each other very snug and the small opening at the joints will permit sewer gases to escape, thus increasing the life of the entire spout.

These elbows are made in all designs and your dimensions can be arranged right on the job.

TRADE MARK

F. Dieckmann

This Emblem of Quality is stamped in each.

THE FERDINAND DIECKMANN COMPANY

P. O. Station B **Cincinnati, Ohio**

lately were taken on the bases announced the first week in December, namely, 2.90 cents base Pittsburgh for rivets and 60 and 10 off for large machine bolts. Several plants have practically obligated their entire output for first quarter on the basis of present operations, but have hope of increasing schedules.

Tin Plate.

One of the last of the oil companies to cover on its tin plate requirements came in for a fairly large tonnage this past week and now all the canmakers as well as oil country users of the plate have practically covered their needs for the first quarter and in many cases for the first half.

Only a few men reported Tuesday and Christmas day the plants were shut down to celebrate, and since some celebrations extended over until Wednesday, little or nothing but loading into railroad cars was done until Thursday or Friday.

Tin plate stock lists are not abnormal for this season, it having been comparatively easy to dispose of the more acceptable stock plates during many weeks past, although price concessions have had to be made.

The open market figure, however, continues unchanged and firm at $5.50 per base box of 100 pounds, Pittsburgh.

Sheets.

Reports from sheet sellers in various sections of the country show a vast change from what they were a few weeks ago, in that they are cheerful as to business in hand and in prospect. This is decidedly unusual for this time of the year and specifications as well as shipments are anywhere from 50 to 100 per cent greater than a month ago.

An increasingly large number of contracts are being written for various grades of sheets, particularly those used in the automotive industries, and not only that, but users here and there are asking that shipments be allowed to come forward as soon as possible.

Some automobile manufacturers would be willing to accept finished sheets between now and the end of the year despite inventories, but in many cases these cannot be produced until January.

Prices are firming up considerably and while slight concessions may be made by one or two small producers of blue annealed sheets, the 3.00 cent price is general, as is 5.35 cents base Pittsburgh, on full-finished. As yet 3.75 cents to 3.85 cents applies on black and 4.90 cents to 5.00 cents, base Pittsburgh, on galvanized, but the minimums in each case are becoming more and more difficult to locate.

Old Metals.

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, $17.50 to $18.50; old iron axles, $26.00 to $26.50; steel springs, $19.50 to $20.00; No. 1 wrought iron, $15.50 to $16.00; No. 1 cast, $18.50 to $19.50, all per net tons. Prices for non-ferrous metals are quoted as follows, per pounds: Light copper, 9½ cents; light brass, 6 cents; lead, 4¾ cents; zinc, 4 cents, and cast aluminum, 15 cents.

Pig Iron Producers Confident of Early Renewal of Buying; Price Position Is Unchanged.

Outlook for New Year Improving Steadily—Chicago Market Described as "Peace and Contentment."

"FURTHER buying, broad in scope, if not great in quantity, marked the week," the *Iron Age* says. "Steel making output may taper off in the remainder of the year, but production of steel ingots for 1923 seems likely to exceed 43,000,000 tons and pig iron output will be a record at over 40,000,000 tons. The idea of price firmness has spread to semi-finished steel."

"Buying is on the upgrade and prospects are favorable," the *Iron Trade* says. "The outlook for the new year is improving steadily and sentiment has become increasingly confident. The result will be an expanding market based on covering for future requirements.

"Consumption apparently is running high and more likely to increase than to shrink. At present, production is at 71 per cent of capacity for the whole country."

Indifference at Pittsburgh on the part of pig iron producers because of their heavy back-logs of business and their present desire to obtain higher figures meets a like measure of indifference on the part of the greater number of pig iron consumers. Many of these latter, particularly the larger users, have covered for their first quarter needs; those who have not protected themselves are buying single carloads to tide them over the holiday period when operating schedules at best are spasmodic.

Steelmaking iron is particularly lacking in activity, no inquiries at all being before the trade for either basic or bessemer.

No sales are noted in the former and only single carloads are being moved in bessemer. The recent negotiation for 5,000 tons of basic developing a $20 valley price has not been concluded. Most producers quote $21 valley, on basic, and $23 valley, on bessemer.

The market is described by a broker as one of "peace and contentment" for the reason producers have a big tonnage on their books and consumers did their first quarter shopping early.

Pig iron for December delivery can be had at $23, furnace.

For first quarter delivery $23.50 is the going quotation.

With general resumptions of operations by the middle of the week, Southern furnace interests are anticipating a buying movement.

First quarter production is well covered.

Yes!

You can buy this better
CORNICE BRAKE
AND
GUTTER FORMER

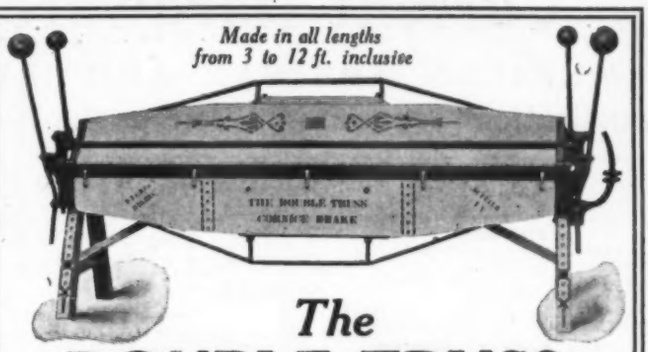
AT A LOWER PRICE THAN OTHER MAKES

FOR over twenty-five years the *Double Truss Cornice Brake* has been giving sheet metal contractors the best kind of service.

Thousands of them are in active use today.

The *Electric City Gutter Former* has over twenty years of satisfactory service to recommend it as the most practical gutter former on the market.

Write for prices today.

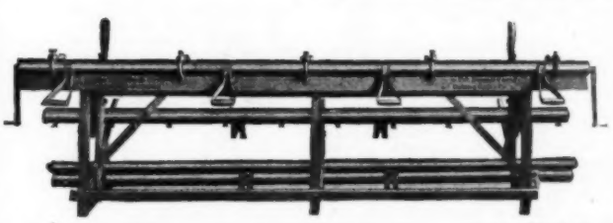


The DOUBLE TRUSS *Cornice Brake*

THE double truss construction of this superior brake makes it extra strong. Its design insures better work, quicker and more accurate operation.

Two grades—all sizes in stock.

If you need a brake you need a Double Truss to save time, work and money.



The ELECTRIC CITY *Gutter Former*

THE most practical machine ever produced for forming long length gutters.

Turns out better gutters quicker. This machine makes complete Half Round Gutter 3 in. to 12 in. with bead on one or both edges.

Its simple, durable construction and easy, fast operation make it worth twice its cost.

All sizes in stock.

We are Specialists in Making these Machines

OUR large factory is devoted exclusively to manufacturing Brakes and Formers.

Our stocks are always complete so shipments can be made promptly. The exclusive patented designs of our machines make them unusually strong and efficient—yet *low in Price.*

Let us tell you how these machines will increase your output and lower your costs.

Write today for full particulars and prices.

FORMING MACHINE CORP.

Successors to
Double Truss Cornice Brake Co.

35 Chandler St., Buffalo, N. Y.

W. B. TOPP, Sydney: Agent for Australia and New Zealand

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly

METALS

PIG IRON.

Chicago Foundry.. 23 00 to 23 50
Southern Fdy. No. 2 .....26 01 to 27 01
Lake Sup. Charcoal 29 04
Malleable ..... 23 00 to 23 50

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$12 45
IX	14x20.....	14 05
IXX	14x20 56 sheets	17 87
IXXX	14x20.....	18 10
IXXXX	14x20.....	19 05
IC	20x28 112 sheets	27 50
IX	20x28.....	29 85
IXX	20x28 56 sheets	16 15
IXXX	20x28.....	17 20
IXXXX	20x28.....	18 25

TERNE PLATES.

		Per Box
IC 20x28, 40-lb.	112 sheets	$25 60
IX 20x28, 40-lb.	" "	28 50
IC 20x28, 30-lb.	" "	21 80
IX 20x28, 30-lb.	" "	24 70
IC 20x28, 25-lb.	" "	20 30
IX 20x28, 25-lb.	" "	22 70
IC 20x28, 20-lb.	" "	18 30
IV 20x28, 20-lb.	" "	21 15
IC 20x28, 15-lb.	" "	17 05
IC 20x28, 12-lb.	" "	15 75
IC 20x28, 8-lb.	" "	14 05

COKE PLATES.

Cokes, 80 lbs., base, 20x28..$12 35
Cokes, 90 lbs., base, 20x28. 14 10
Cokes, 100 lbs. base, 20x28. 14 45
Cokes, 107 lbs., base, IC 20x28 ..... 14 85
Cokes, 135 lbs. base, IX 20x28 ..... 17 40
Cokes, 155 lbs. base, 56 sheets 9 75
Cokes, 175 lbs. base, 56 sheets 10 65
Cokes, 195 lbs. base, 56 sheets 11 70

BLUE ANNEALED SHEETS.

Base .....per 100 lbs. $3 50

ONE PASS COLD ROLLED BLACK.

No. 18-20.....per 100 lbs. $4 50
No. 22-24.....per 100 lbs. 4 55
No. 26.....per 100 lbs. 4 60
No. 27.....per 100 lbs. 4 65
No. 28.....per 100 lbs. 4 70
No. 29.....per 100 lbs. 4 75

GALVANIZED.

No. 16.....per 100 lbs. $5 10
No. 18-20.....per 100 lbs. 5 25
No. 22-24.....per 100 lbs. 5 40
No. 26.....per 100 lbs. 5 55
No. 27.....per 100 lbs. 5 70
No. 28.....per 100 lbs. 5 85
No. 30.....per 100 lbs. 6 85

BAR SOLDER.

Warranted.
50-50 .....per 100 lbs. 30 75

Commercial.
45-55 .....per 100 lbs. 30 00
Plumbers .....per 100 lbs. 28 75

ZINC.

In Slabs 7 28

SHEET ZINC.

Cask lots, stock, 100 lbs... 11 00
Less than cask lots, 100 lbs. 11 50

BRASS.

Sheets, Chicago base 19¾c
Mill Base 17¾c
Tubing, brazed, base 25¾c
Wire, base 18¼c

COPPER.

Sheets, Chicago, base.....20¾c
Mill base 20c
Tubing, seamless, base.....24c
Wire, No. 9 & 10 B. & S. Ga. 17¾c
Wire, No. 11, B. & S. Ga....17¾c

LEAD.

American Pig 8 75
Bar 9 75

Sheet.
Full Coils....per 100 lbs. 10 75
Cut Coils.....per 100 lbs. 11 75

TIN.

Pig Tin .....per 100 lbs. 49¾c
Bar Tin .....per 100 lbs. 51¾c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's .....Net
White's .....Net

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%

Winchester.
Smokeless Repeater Grade .....20 & 4%
Smokeless Leader Grade .....20 & 4%
Black Powder .....20 & 4%

U. M. C.
Nitro Club .....20 & 4%
Arrow .....20 & 4%
New Club .....20 & 4%

Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16.....6c per lb.
Rollboard .....6¼c per lb.
Millboard 2/32 to ⅛....6c per lb.
Corrugated Paper (250 sq. ft. to roll)....$6.00 per roll

AUGERS.

Boring Machine.....40&10%
Carpenter's Nut 50%

Hollow.
Stearns, No. 4, doz.....$11 50

Post Hole.
Iwan's Post Hole and Well 25%
Vaughan's, 4 to 9 in.....$15 60

AXES.

First Quality, Single Bitted (unhandled, 3 to 4 lb., per doz.....$14 00
Good Quality, Single Bitted, same weight, per doz. 13 00

BARS, CROW.

Steel, 4 ft., 10 lb.....$ 80
Steel, 5 ft., 18 lb..... 1 40
Pinch bars, 5½ ft., 24 lb..... 1 60

BARS, WRECKING.

V. & B. No. 12.....$0 34
V. & B. No. 24..... 0 43
V. & B. No. 324..... 0 57
V. & B. No. 20..... 0 48
V. & B. No. 320..... 0 63

BITS.

All Vaughan and Bushnell.
Screw Driver, No. 30, each $ 27
Screw Driver, No. 1, each 16
Reamer, No. 30, each... 41
Reamer, No. 100 each... 41
Countersink, No. 12, each.. 20
Countersink, Nos. 14-15 each 27

BLADES, SAW.

Wood.
Atkins 30-in.
Nos. ..... 6 $3 90 | 40 $3 45 | 26 $5 40

BLOCKS.

Wooden 45%
Patent 45%

BLOW TORCHES (See Firepots).

BOARDS.

Stove.	Per Doz.
Crystal, 23"	28 90

Wash.

No. 760, Banner Globe (single) .....per doz.	$5 25
No. 652, Banner Globe (single) .....per doz.	6 75
No. 801, Brass King, ...per doz.	8 25
No. 860, Single—Plain Pump	6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅝x6 and sizes smaller and shorter 50%
Carriage sizes, larger and smaller and shorter....50-10%
Machine, ⅝x4 and sizes smaller and shorter.....50-5%
Machine, sizes larger and longer than ⅝x4.....50-10-5%
Stove 70-10%

BRACES, RATCHET.

V. & B. No. 444 8 in.....$4 54
V. & B. No. 322 8 in..... 3 89
V. & B. No. 111 8 in..... 3 55
V. & B. No. 11 8 in..... 3 02

BRUSHES.

Hot Air Pipe Cleaning.
Bristle, with handle, each $0 85

Flue Cleaning.
Steel Only, each.....$1 25

BURRS.

Copper Burrs only.....40%

BUTTS.

Steel, antique copper or dull brass finish—case lots—
2½x3½—per dozen pairs $3 48
4x4 ..... " " " 4 74
Heavy Bevel steel inside sets, case lots—
.....per dozen sets 8 00
Steel bit keyed front door sets, each 2 00
Wrought brass bit keyed front door sets, each.... 4 00
Cylinder front door sets, each 8 50

CEMENT, FURNACE.

American Seal, 5 lb. cans, net $ 45
" " 10 lb. cans, " 90
" " 25 lb. cans, " 2 00
Asbestos, 5 lb. cans " 45
Pecora.....per 100 lbs. 7 51

CHAINS.

Sher. Steel Safety Chain.
500-ft. coil, per ft..... .02
100 to 500 ft., per ft.... .02½
Less than 100 ft., per ft .03

Iron Jack Chain.
Box (12 yds.)..... .45

CHIMNEY TOPS.

Iwan's Complete Rev. & Vent. 30%
Iwan's Iron Mountain only..35%
Standard .....30 to 40%

CHISELS.

Cold.
V. & B. No. 25, ¼ in., each $0 26
V. & B. No. 26, ⅜ in., each 41

Diamond Point.
V. & B. No. 55, ¼ in..... 0 31
V. & B. No. 55, ½ in..... 0 48

Firmer Bevelled Round Nose.
V. & B. No. 65, ¼ in..... 0 29
V. & B. No. 65, ½ in..... 0 40

Socket Firmer.
Cape.
V. & B. No. 50, ⅜ in..... 0 31
V. & B. No. 50, ⅝ in..... 0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers .....List less 25-40%
Yankee, for Yankee Screw Drivers $6 00

CLAMPS.

Adjustable.
No. 100, Door (Stearns) doz. $22 00

Carpenters'.
Steel Bar..List price plus 20%

Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20

CLINKER TONGS

Front Rank, each.....$1 75
Per doz. 1 85

CLIPS.

Damper.
Acme, with tail pieces, per doz. $1 25
Non Rivet tail pieces, per doz. 30

COPPERS—Soldering.

Pointed Roofing.
8 lb. and heavier....per lb. 40c
2½ lb..... " 46c
2 lb..... " 48c
1½ lb..... " 55c
1 lb..... " 60c

CORD.

No. 7 Std. per doz. banks..$11 00
No. 8 " " " " 12 60

CORNICE BRAKES.

Chicago Steel Bending.
Nos. 1 to 6 B.....10%

COUPLINGS, HOSE.

Brass.....per doz. $2 25

CUT-OFFS

Kuehn's Korrekt Kutoffs:
Galv., plain, round or cor. rd
Standard gauge 40%
26 gauge 10%

DAMPERS.

"Yankee" Hot Air.

7 inch, each	20c, doz.		$1 75
8 "	"	25c, "	2 40
9 "	"	30c, "	2 75
10 "	"	32c, "	3 00

Smoke Pipe.

7 inch, each		$ 35
8 "	"	40
9 "	"	50
10 "	"	60
12 "	"	90

Reversible Check.

8 inch, each		$1 50
9 "	"	1 70

DIGGERS.

Post Hole.
Iwan's Split Handle (Eureka)
4-ft. Handle...per doz. $14 00
7-ft. Handle...per doz. 26 00
Iwan's Hercules pattern, per doz. 14 00

DRILLS.

V. & B. Star, 12-inch Length.
¼, 5/16 and ⅜, each....$ 24
⅜, each 30
½, each 54
1¼, each 91
V. & B. Star, 18-inch Length.
5/16 and ⅜, each.....$ 33
⅜, each 45
½, each 69
1¼, each 1 05

EAVES TROUGH.

Milcor .....
Galv. Crimpedge, crated...75%

ELBOWS—Conductor Pipe.

Milcor .....
Galv., plain or corrugated, round flat
Crimp, Std. gauge.....65%
26 Gauge 40%
24 Gauge 10%

Square Corrugated.
Milcor .....
Standard gauge 45%
26 gauge 30%

Portico Elbows.
Standard Gauge Conductor Pipe plain or corrugated.
Not nested .....70 & 5%
Nested solid .....70 & 5%

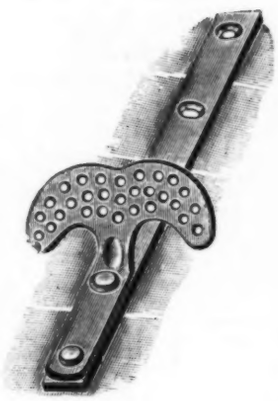
ELBOWS—Stove Pipe.

1-piece Corrugated. Uniform.

	Doz.
5-inch	$1 45
6-inch	1 60
7-inch	2 10

Special Corrugated.

	Doz.
6-inch	$1 45
7-inch	1 75



BBC

Order your supplies from "Tinsmiths Headquarters" and get high quality goods promptly at right prices.

RELY on us to fill your orders to your utmost satisfaction.

We've been the "House of Service" for thousands of Sheet Metal Contractors for many years.

Being manufacturers as well as jobbers we are able to keep our stocks the largest and most complete in the country.

SHEET METALS OF ALL KINDS
"ARMCO" AND "TONCAN" SHEETS
Copper, Zinc and Lead Sheets

"SHUR-LOCK" CONDUCTOR PIPE
"E-Z" GUTTER
"PARKER" PRODUCTS
Skylights—Ventilators

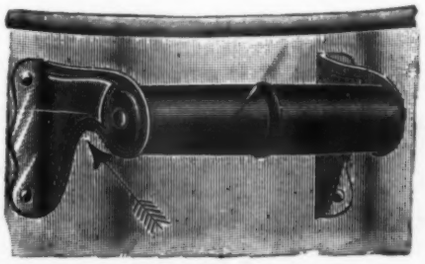
PECK, STOW AND WILCOX'S
TINNERS MACHINES AND TOOLS
Warm Air and Stove Pipe
FIRE POTS—ROOFING SUPPLIES

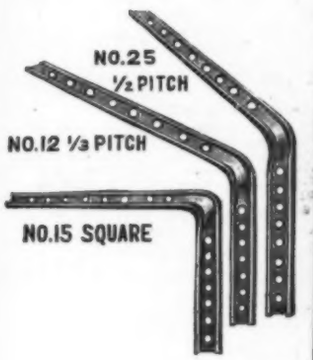
and practically every other item known to the trade.

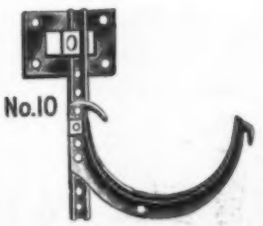
Write for our large illustrated Catalog No. 9.

BERGER BROS. CO.

229-231-233-235-237 ARCH STREET
Warerooms and Factory
100 to 114 Bread Street
PHILADELPHIA, PA.







Pat. July 19, 1921

Uniform, Collar Adjustable.

	Doz.
5-inch	$2 00
6-inch	2 10
7-inch	2 60

WOOD FACES—50% off list.

FENCE.

Field Fence	60½
Lawn "	53%

FILES AND RASPS.

Heller's (American)	65-5%
American	65-5%
Arcade	60 & 10%
Black Diamond	50-5%
Eagle	60-10%
Great Western	60 & 10%
Kearney & Foot	60 & 10%
McClellan	60 & 10%
Nicholson	50-14%
Simonds	60%

FIRE POTS.

Ashton Mfg. Co.

Complete line Firepots and Torches...52%

Otto Bernz Co.

No. 1 Furn. Gasolene with large shield, 1 gal.	$ 6 75
No. B Furn. Kerosene, 1 gal.	15 12
No. 10 Brazier, Kerosene or Gasolene, 10 gals.	47 52
No. 5 Torch, Gasolene or Kerosene, 1 pt.	7 92
No. 83 Torch, Gasolene, 1 quart	5 40
No. 86 Torch, Gasolene, 1 pt.	4 05

Clayton & Lambert's.

East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 52%
West of above boundary line. 48%

Geo. W. Diener Mfg. Co.	Ea.
No. 02 Gasolene Torch, 1 qt.	$ 5 55
No. 0250, Kerosene or Gasolene Torch, 1 qt.	7 50
No. 10 Tinners' Furn. Square tank, 1 gal.	12 60
No. 15 Tinners' Furn. Round tank, 1 gal.	12 00
No. 21 Gas Soldering Furnace	3 60
No. 110 Automatic Gas Soldering Furnace	10 50

Double Blast Mfg. Co.

Gasolene, Nos. 25 and 35...60%

Quick Meal Stove Co.

Vesuvius, F.O.B. St. Louis 30% (Extra Disct. for large quantities)

Chas. A. Hones, Inc.	
Buzzer No. 1	$ 9 00
" " 2	12 00
" " 22	13 50
" " 42	15 00
" " 43	19 00

FREEZERS—ICE CREAM.

Peerless and Alaska	
1 quart	$2 95
2 quart	3 45
3 quart	4 10
White Mountain	
½ quart	$3 50
1 quart	4 90
2 quart	5 70

GALVANIZED WARE.

Pails (Competition), 8 qt.	$1 85
10-qt.	2 10
12-qt.	2 30
14-qt.	2 57
Wash tubs, No. 1	$6 25
No. 2	7 00
No. 3	8 25

GARAGE DOOR HARDWARE.

Stanley ..... All net

GAUGES.

Marking, Mortise, etc. ..... Nets

Wire.

Disston's 35%

GIMLETS.

Discount ..... 65% and 10%

GLASS.

Single Strength, A and B, all sizes ..... 83 & 85%
Double Strength, A, all sizes 84%

GREASE, AXLE.

Frazers'	
1-lb. tins, 36 to case, per case	$ 4 70
3-lb. tins, 24 to case, per case	7 80
5-lb. tins, 12 to case, per case	7 20
10-lb. tins, per dozen	10 40
15-lb. tins, per dozen	13 80
25-lb. tins, per dozen	19 80

HAMMERS, HANDLED.

All V. and B.	Each, net
Blacksmiths' Hand, No. 0, 26-oz.	$1 60
Engineers' No. 1, 26-oz.	1 60
Farrier's, No. 7, 7-oz.	92
Machinists', No. 1, 7-oz.	78
Nail.	
Vanadium, No. 41, 26-oz. each	1 59
Vanadium, No. 41½, 16-oz., each	1 59
V. & B., No. 11½, 16-oz. each	1 01
Garden City, No. 111½, 16-oz., each	75
Tinner's Riveting, No. 1, 8-oz., each	79
Shoe, Steel, No. 1, 18-oz., each	65
Tack.	
Magnetic. No. 5, 4-oz., each	81

HAMMERS, HEAVY.

Farrier's, No. 10, 10-oz. $1 01

HANDLES.

Axe.	
Hickory, No. 1. ... per doz.	4 00
Hickory, No. 2. ... "	3 00
1st quality, second growth	6 00
Special white, 2nd growth	5 00
Chisel.	
Hickory, Tanged, Firmer Assorted ..... per doz.	55c
Hickory, Socket, Firmer, Assorted ..... per doz.	70c
File ..... per doz.	$1 20
Hammer and Hatchet.	
No. 1 per doz.	$0 90
Second growth hickory, per doz.	1 50
Soldering.	
Per doz.	$2 40

HANGERS.

Conductor Pipe.	
Milcor Perfection Wire	25%
Eaves Trough.	
Steel hangers	30%
Triple Twist wire	10%
Milcor Eclipse Wire	20%
Milcor Triplex Wire	15%
Milcor Milwaukee Extension	15%
Milcor Steel (galv. after forming) List plus	12½%
Milcor Selflock E. T. Wire, List plus	40%

HASPS.

Hinge, Wrought, with staples, Net

HATCHETS.

V. and B. Supersteel.	Each
Broad, No. 1, 24-oz.	$1 42
Half, No. 1, 15-oz.	1 25
Half, No. 3, 27-oz.	1 37
Claw, No. 1, 19-oz.	1 31
Flooring, No. 1, 20-oz.	1 43
Shingling, No. 1, 17-oz.	1 20
Lathing, No. 1, 14-oz.	1 20
Lathing, No. 2, 17-oz.	1 25
Vanadium Steel.	
Half, No. 62, 22-oz.	$1 82
Underhill Pattern Lathing, 9 row, 19-oz.	2 29

HINGES.

Heavy Strap, in Bundles.	
4 inch, dozen prs.	$1 12
5 " " "	1 57
6 " " "	1 93
8 " " "	3 21
Extra Heavy T in Bundles.	
4 inch, dozen prs.	$1 74
5 " " "	1 85
6 " " "	2 21
8 " " "	3 9[illegible]

HOES.

Garden ..... Net

HOOKS.

Box.	
V. and B. No. 9, each	$0 26
Conductor.	
Milcor	
"Direct Drive" Wrought Iron for wood or brick	15%
Cotton.	
V. and B. No. 8, each	24
Hay.	
V. and B. No. 1, each	26
Bar Meat.	
V. and B. No. 26, ⅝", each	09
V. and B. No. 28, ½", each	16
Screw Meat.	
V. and B. No. 2, per gro.	6 50
Butchers' "S."	
V. and B. No. 6, each	08
V. and B. No. 8, each	11

HOSE.

	Per. Ft.
¾-in. 2 ply molded	9½c to 12½c
¾-in. cord	8½c to 10c
¾-in. wrapped	13½c

HUMIDIFIERS.

"Front-Rank," Automatic.	
In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

IRONS.

Sad.	
Genuine Mrs. Potts, nickel plated, per set	$1 55
Asbestos No. 70, per set.	2 10
Asbestos No. 100, per set.	2 30
E. C. Stearns'.	
No. OA Corner, doz. sets	$2 50
No. OB " " "	2 75

KNIVES.

Butcher.	
Beechwood Handles, 6-inch blade	25%
Beechwood Handles, 7-inch blade	25%
Beechwood Handles, 8-inch blade	25%
Cooper's Hoop.	25%
Drawing.	
Standard	25%
Adjustable	25%
Barton's Carpenters'	25%
Hay.	
Iwan's Solid Socket	25%
Heath's	25%
Iwan's Sickle Edge	25%
Iwan's Imp'd Serrated	25%
Hedge.	
Challenge	25%
Disston's No. 1	25%
Putty.	
Common	25%
Lander's	25%
Scraping.	
Beech Handles	25%
Lander's	25%

KNOBS.

Door.	
Mineral ..... per doz.	$2 00
Porcelain ..... "	2 00
Jet ..... "	3 00

LADDERS.

Step.	
Common, per ft.	28c
Common, with Shelf, add 10c	
IXL	34c
Challenge, 6 to 9 ft.	55c
10 to 16 ft.	60c
Kant-Break, per lineal ft.	75c

LANTERNS.

	Per doz.
Monarch tin, hot blast	$ 8 25
Dietz No. 2, cold blast	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 90

LAWN MOWERS.

12-inch	$5 20
16-inch	5 85
Ball Bearing.	
4 blade, adjustable bearing.	
14"	$7 50
16"	7 80

LEATHER BELTING.

From No. 1 Oak Tanned Butts.	
Extra heavy, 18-oz.	35%
Heavy, 16-oz.	40%
Medium, 14½-oz.	40%
Light, 13-oz.	50%

LEATHER LACING.

Cut, strictly No. 1 ..... 45%

LEVELS.

Disston, No. 28 Asst.	$22 [illegible]
" No. 18, 20 in., each	1 [illegible]
" No. 22, 24 in., each	2 [illegible]
" Shafting, 6 in.	19 [illegible]
" " 6 in. gr. glass	24 [illegible]
" No. 1 Asst.	5 [illegible]
" No. 2 Asst.	12 [illegible]
" 24-26 in., each	1 [illegible]
" 28-30 in., each	1 00

LIFTERS.

Stove Cover.	
Coppered ..... per gro.	$4 00
Alaska ..... "	4 75

LOCKS.

Barn Door.	
No. 60 Stearn's. per doz.	$11 00
No. 80 " "	20 00

MALLETS.

Carpenters'.	
Fibre Head No. 2, per doz.	$12 00
" No. 3, "	15 50
" No. 3½, "	20 50
Round Hickory ..... per doz.	$3 00— 5 00
Tinners'.	
Hickory ..... per doz.	$2 25

MATS.

Door.	
National Rigid	5 & 10 & 5%
Acme Steel Flexible	50%

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets	20%
Milcor	
Galv. one piece stamped	40%

MOPS.

Cotton, Star (Cut Ends).	
Pounds 12' 16' 18' 24'-3-oz.	
Per doz. $4 00 4 25 5 50 7 00	
Enterprise	16⅔%
Parker	50 & 5%

NAILS.

Cut Steel	$4 70
Cut Iron	4 70
Wire.	
Common	3 80
Cement Coated	3 40

NETTING, POULTRY.

Galvanized before weaving	45-10%
Galvanized after weaving	45%

NIPPERS.

Nail Cutting.	
V. & B. No. 30	75c
Double Duty.	
V. & B. No. 60	75c
Hoof.	
Heller's	40 & 10%
V. & B. No. 52, each	$2 25

NOZZLES.

Hose.	
Magic ..... per doz.	$9 50
Diamond ..... "	5 75

OILERS.

Chase Pattern.	
Brass and Copper	10%
Zinc Plated	40 & 5%
Railroad.	
Brass	30 & 5%
Coppered	50 & 5%
Steel.	
Copper Plated	70 & 5%

OPENERS.

Delmonico ..... per doz.	$1 25
Never Slip ..... "	65
Crate.	
V. & B. ..per doz.	$7 25—11 00

Everything Used in Sheet Metal Work

OSBORN'S
IC
GUARANTEED
OLD STYLE
40 POUNDS COATING

A brand almost as old as the tin-plate industry in this country—it identifies a product that has stood the test of time.

Supplied in IC and IX thickness; 112 Sheets per case; 20x28; the IC gauge will weigh about 246 lbs. net.

Since 1872

We offer the trade a thoroughly dependable service based on over 50 years of experience in supplying the needs of Sheet Metal Workers and Furnacemen. Our constant growth—an ever-increasing list of satisfied customers—testify to the quality of Osborn Products.

Catalog No. 24, ready for distribution very soon, will be sent at your request.

The J. M. & L. A. Osborn Co.
CLEVELAND OHIO

"Yes sir! I'll hire the man who can design, proportion and lay-out work like this pipe system and these fittings. In the future we shall hire all our men by this test," Says a Sheet Metal Employer.

WHICH OF THESE OPPORTUNITIES ARE YOU WORKING FOR

FAN HEATING VENTILATING is the pinnacle of all the other branches in the entire Sheet Metal Industry. It offers more distinct chances for Advancement than any of the other fields. It is a public necessity; everybody must have heat. Think of it!

HEATING VENTILATING ENGINEERING PREPARES YOU FOR

1. For Employers it enlarges their business opportunities 100%.
2. For Employees, it raises to Foremanship or Superintendent of a Shop.
3. Or as Designing Engineer with some large Heating Contractor.
4. As an intelligent Salesman of Manufactured Heating Appliances.
5. As Chief Engineer with a Heating or Furnace Mfg. Co.
6. Later as Consulting Engineer to Architects and Building Contractors, etc.

This Course has lately been completely revised and enlarged, and is prepared so tradesmen can understand what is taught. It will not shoot over your head as so many studies do on the subject.

WE TEACH YOU IN YOUR OWN HOME, PERSONAL, CLEAR, DIRECT.

Full Information Free—Select Your Course

☐ **FAN HEATING AND VENTILATING ENGINEERING**
☐ **SHEET METAL DESIGN AND PATTERN DRAFTING**
☐ **BUSINESS MANAGEMENT**

ST. LOUIS TECHNICAL INSTITUTE O. W. Kothe, Prin. 4543 Clayton Ave., ST. LOUIS, MO.

PAILS.

Cream.
14-qt. without gauge, ... per doz. $9 50
18-qt. without gauge, ... per doz. 11 00
20-qt. without gauge, ... per doz. 11 75

Sap.
10-qt., IC Tin....per doz. $4 00
12- " " " " 5 50

Stock.

Galv. qts.	14	16	18	20
Per doz.	$9 75	10 75	12 75	14 50

Water.

Galvanized qts.	10	12	14
Per doz.	$5 75	6 50	7 25

PASTE

Asbestos Dry Paste:
200-lb. barrel $15 00
100-lb. barrel 8 00
25-lb. pail 3 25
10-lb. bag 1 00
5-lb. bag 55
2½-lb. cartons 30

PINCERS.

All V. & B.

Carpenters', cast steel, No.	6	8	10	12
Each	$0 43	$0 52	$0 61	$0 71

Blacksmiths', No. 10.....$0 64

PIPE.

Conductor.
"Interlock" Galvanized.
Crated and nested (all gauges) 60-20%
Crated and not nested (all gauges) 60-15%
Square Corrugated A and B and Octagon.
29 Gauge 60-10%
28 " 60-10%
26 " 60-10%
24 " 60-10%

"Interlock."
Crated and nested (all gauges) 60-20%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.

Stove. Per 100 joints.
26 gauge, 5 inch E. C. nested $17 00
26 gauge, 6 inch E. C. nested 18 00
26 gauge, 7 inch E. C. nested 19 00
28 gauge, 5 inch E. C. nested 15 00
28 gauge, 6 inch E. C. nested 16 00
28 gauge, 7 inch E. C. nested 18 00
30 gauge, 5 inch E. C. nested 13 00
30 gauge, 6 inch E. C. nested 14 00
30 gauge, 7 inch E. C. nested 16 00
T-Joint Made up, 6-inch..... per 100 $40 00

Furnace Pipe.
Double Wall Pipe and Fittings 33⅓%
Single Wall Pipe, Round Pipe Fittings 33⅓%
Galvanized and Back Iron Pipe, Shoes, etc...33⅓%
Milcor Galvanized 40%

PLANES.

Stanley Iron Bench.....Net

PLIERS.

(V. & B.)
Nut, No. 3, each.....$2 60
" No. 5, each..... 64
" No. 25, each..... 69
Gas, No. 7, each..... 55
" No. 8, each..... 61
" No. 12, each..... 87
Lining or Crimping.
No. 35, each..... 64
Button's Pattern.
No. 6 each..... 61
No. 8 each..... 74
Double Duty, No. 106..... 50

POINTS, GLAZIERS'.

No. 1, 2 and 3..per doz. pkgs. 65c

POKERS, STOVE.

Wr't Steel, str't or bent, ... per doz. $0 75
Nickel Plated, coil handles ..... " 1 10

POKERS, FURNACE.

Each $0 50

PULLEYS.

Furnace Tackle.....per doz. $0 60
Per gross 6 00
" Screw (encased) ...per doz. $0 85

Ventilating Register.
Per gross $9 00
Small, per pair..... 0 30
Large, per pair..... 0 50

PUNCHES.

Machine.		Each.
V. & B., No. 11-13, 1½x6		$0 19
V. & B., No. 90, ⅝x9		27
V. & B., No. 10, ⅞x10		29
V. & B., No. 1-6, ½x6		12

Center.
V. & B., No. 50, ⅝x4.....$0 14

Belt.
V. & B., No. 101-103.....$0 24
V. & B., No. 108-109..... 33
V. & B., No. 25, ass't..... 3 30

Samson Line.
No. 1 Hand { Doz. lots or less 40%
No. 2 Hand { 3 doz. lots ..Less 40 & 5%
No. 4 Hand { 6 doz. lots or more...Less 50%
No. 3 Bench { Less than doz. lots...Less 25%
Doz. lots or more...Less 40%

Extra Punches and Dies for Samson:
No. 1 Hand { Less than doz. lots....Less 25%
No. 2 Hand { Doz. lots, ...Less 33⅓%
No. 4 Hand { 3 doz. lots, ...Less 40%
No. 3 Bench { 6 doz. lots or more, ..Less 40 & 10%

PUTTY.

Commercial Putty, 100-lb. kits $3 65

QUADRANTS.

Malleable Iron Damper.....10%

FLOOR REGISTERS AND BORDERS.

Cast Iron 20%
Steel and Semi-Steel.....33⅓%
Baseboard 33⅓%
Adjustable Ceiling Ventilators 33⅓%

Register Faces—Cast and Steel
Japanned, Bronzed and Plated, 4x6 to 14x14.....33⅓%
Large Register Faces—Cast, 14x14 to 38x42.....60%
Large Register Faces—Steel, 14x14 to 38x42.....65%

ROOFING.

Per Square
Best grade, slate surf. prep'd $1 85
Best talc surfaced..... 2 20
Medium talc surfaced..... 1 50
Light talc surfaced..... 95
Red Rosin Sheeting, per ton $72 00

ROPE.

Cotton.

Sisal.
1st Quality, base.....13½c
No. 2 .....12½c

Manila.
1st Quality standard brands 15½c
No. 2 .....14½c
Hardware Grade, per lb.....12½c

SAWS.

Butchers'.
Atkins No. 2, 14-in.....$12 75
" No. 2, 18-in..... 14 30
" No. 7, 16-in..... 15 85
" No. 2, 22-in..... 15 92
" No. 7, 20-in..... 18 05
" No. 7, 24-in..... 20 20
" No. 7, 28-in..... 22 25

Compass.
Atkins No. 2, 10-in.....$ 5 45
" No. 10, 10-in..... 5 60
" Blades, No. 2, 10-in. 3 25
" " No. 2, 10-in. 3 30

Cross-Cut.
Atkins No. 221, 4 ft.....$3 03
" No. 221, 6-ft..... 4 45
" No. 221, 8-ft..... 6 07

Hand.
Copper Burrs only.....30%
" No. 96, 20-in..... 21 70

Hand and Rip.
Atkins No. 54, 20-in.....$19 50
" No. 54, 26-in..... 24 40
" No. 53, 16-in..... 18 10
" No. 53, 20-in..... 22 90
" No. 53, 24-in..... 26 60
" No. 53, 28-in..... 31 45
" No. 53, 30-in..... 34 15

Keyhole.
Atkins No. 1, complete.. $3 10
" No. 2, complete.. 3 70

Miter Box.
Atkins No. 1, 4x20.....$32 65
" No. 1, 5x22..... 38 00
" No. 1, 6x22..... 42 20

Pruning.
Atkins No. 20, 12-in.... $ 8 45
" No. 10, 16-in.... 18 15

Wood.
Atkins No. 202.....$ 7 19
" No. 318..... 8 75
" No. 906..... 15 50
" No. 1509..... 16 56

SCRAPERS.

Box.
No. 6, six blades each.... 25c
Hog.
No. 6, each..... 25c
Floor (Stearns).
No. 10, each.....$11 50

SCREEN DOOR HINGES.

Cast Iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Wood.
F. H. Bright 80%
R. H. Blued 78%
F. H. Jap'd 74%
F. H. Brass 76%
R. H. Brass 74%

Sheet Metal.
No. 7, ½x ½, per gross.$0 55
No. 10, ¾x3/16, per gross. 75
No. 14, ⅞x ¼, per gross. 90

SCREW DRIVERS.

Uncle Sam Standard Head.
3 inches, each.....$ 45
5 inches, each..... 52
8 inches, each..... 68
12 inches, each..... 1 02

Uncle Sam Insulated Head.
3 inches, each.....$ 49
5 inches, each..... 57
8 inches, each..... 76
12 inches, each..... 1 14

SETS.

Nail.
V. & B.
No. 100, in cardboard boxes .....doz. $1 55
No. 100, in wooden boxes, ... doz. 1 58
No. 30, assorted.....doz. 39
No. 5, in cardboard boxes, ... doz. 1 25
No. 5, in wooden boxes, ... doz. 1 30

Rivet.
V. & B.
Farmers' $0 19
Tinners' 3-4 ..... 0 40
" 00-0..... 0 60

Saw.
Atkins No. 10....per doz. $3 80
" No. 12.... " 6 20

SHEARS.

	Per Doz
Nickel Plated, Straight, 6"	$13 90
" " " 7"	14 85
" " " 8"	16 20
Japanned, Straight ....6"	11 00
" " ....7"	12 40
" " ....8"	13 80

SHEARS, TINNERS' & MACHINISTS'.

Viking $22 00

Lennox Throatless.
No. 18 .....35%
Shear blades.....10%
(f.o.b. Marshalltown, Iowa.)

Peerless Steel Squaring.
Foot Power.
No. 1—30", 18 ga. cap.....15%
No. 2—36", 18 ga. cap.....15%
No. 4—52", 18 ga. cap.....15%
No. 10—120", 22 ga. cap...15%
No. 4A—52", 16 ga. cap....15%

Cast Iron Foot Power.
No. 01, 30", 18 ga. cap....15%

Power Driven.
(No. 100 Series, 2 Shaft Drive.)
No. 142—42", 18 ga. cap....15%
(No. 200 Series, 2 Shaft Underneath Drive.)
No. 242—42", 14 ga. cap...15%
(No. 300 Series, 3 Shaft Underneath Drive.)
No. 342—42", 10 ga. cap....15%
No. 372—72", 10 ga. cap....15%
(No. 500 Series, 3 Shaft Underneath Drive.
No. 596—96", 10 ga. cap...15%
(No. 600 Series, 3 Shaft Underneath Drive.)
No. 6120—120", 3/16" cap..15%

SHINGLES.

Per Square
Zinc (Illinois) .....$18 0'

SHOES.

Milcor.
Galv. Std. Gauge, Plain or corg. round flat crimp...65%
26 gauge round flat crimp..40%
24 gauge round flat crimp..10%
Conductor 65%

SHOVELS AND SPADES.

Coal.
Hubbard's.

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 25	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's.

Size	A	B	C
14"	$17 15	$16 40	$15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 35
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Alaska Steel.
D-Handle .....per doz. $3 50
Long Handle ..... " 3 00

SIFTERS.

Genuine Hunters, doz.....$2 50

SKATES.

Ice, Men's and Boys'.
Per Pair
Key Clamp—rocker—bright finish .....$ 76
Key Clamp—rocker—nickel finish 1 10
Key Clamp—rocker — pol. steel 1 36
Key Clamp—Hockey 1 38
Skate outfits 4 75
Women's and Girls'.
½ Key Clamp—rocker....$1 31
" " hockey .. 1 38
Ice Skate outfit 5 00
Roller.
Ball Bearing—Boys' $1 55
Ball Bearing—Girls' 1 65

No. 22 Fire Pot
Ask for Latest Price

OUR LATEST ACHIEVEMENT

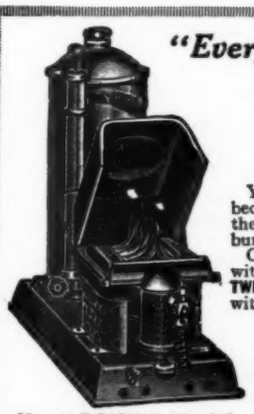
No. 22 has all good points found in other Coil Fire Pots and our latest patented improvements. Rust proof steel tank, heavy uprights, brass fittings, strong valve, powerful pump and large funnel and filler plug. Top section is easily removed. There are no coil cup lugs or nuts to burn off. Jobbers supply at factory prices. Write for a catalogue.

CLAYTON & LAMBERT MFG. CO.
10635 Knodell Avenue
DETROIT, MICH., U. S. A.

Torrid

ONCE a user always a user. Torrid Tinners Furnaces are a standard of their own reputation.

Geo. W. Diener Mfg. Co., Chicago, Ill.



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DOUBLE BLAST
Gasoline Burning
FIRE POTS

You waste no heat or fuel when you use them because the **TWO** hot blast flames are forced to the center of the burner. The fuel always burns with a blue flame.

Our **No. 25 DOUBLE BLAST FIRE POT** shown herewith is guaranteed to heat soldering irons **TWICE AS FAST** as any other fire pot made, and with **ONE-HALF** the gasoline the others use.

This is an excellent fire pot and one that will stand up under hard use. We would be glad to give you more information and prices on this and other models.

Write for our illustrated catalog today

DOUBLE BLAST MFG. CO.
NORTH CHICAGO, ILL.

No. 25 DOUBLE BLAST
Tinners' Fire Pot

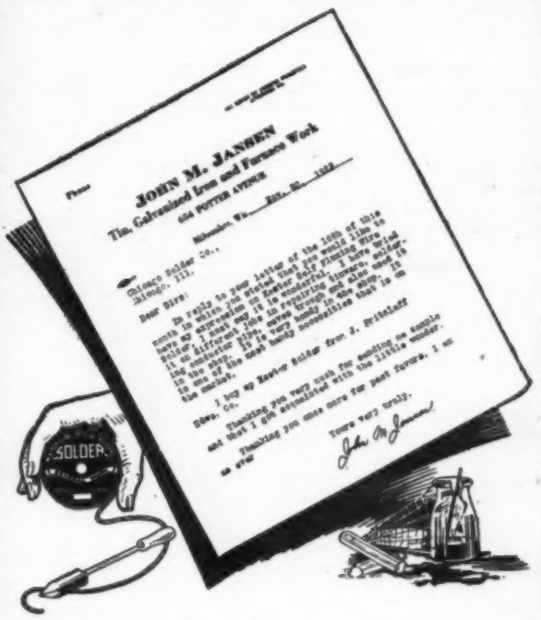
CHICAGO STEEL SLITTING SHEAR
LIGHT—POWERFUL DURABLE

Capacity 10 gauge sheets
Any Length or Width
Flat Bars 3/16 x 2"
Weight 22 pounds

Price $12.50 Net
F. O. B. Chicago

Made of pressed steel and equipped with hold-down. Blades of highest grade crucible steel Most indispensable high grade shears made. Equal to other shears selling at over twice the price. *ORDER YOURS TODAY*

DREIS & KRUMP MFG. CO., 2915 S. Halsted St., Chicago



"Handiest Necessity"

John M. Jansen is one of us, he runs against the same problems as the majority of sheet metal workers and here's how he solved his soldering problem.

"I have tried Kester *Acid-Core* Wire Solder on different jobs in repairing tinware, soldering conductor pipe, eaves trough and also used it in the shop. It is very handy in the shop. *It is one of the most handy necessities that is on the market.*"

Follow his suggestion—write us for a sample to try on your own work.

Sold everywhere by live dealers in one pound coils, in cartons, and on one, five and ten pound spools

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RICHARD F. ELY
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New York City

KESTER
Acid Core WIRE SOLDER

"Requires Only Heat"

SNIPS, TINNERS'.

Clover Leaf .....40 & 10%
National .....40 & 10%
Star 50%
Milcor .....Net

SQUARES.

Steel and Iron.....Net
(Add for bluing, $3.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Mitre..... "
Fox's .....per doz. $6.00
Winterbottom's 10%

STAPLES.

Blind.
Barbed .....per lb. 21c@22c
Butter, Tub ..... " 16@19c
Fence—
Polished .....per 100 lbs. $5 45
Galvanized ..... " 6 15
Netting.
Galvanized ...per 100 lbs. $6 54
Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50&10%
Extra heavy 35%

STONES.

Axe.
Hindustan ....per lb. New Nets
More Grite .... " "
Washita ..... " "
Emery.
No. 126.....per doz. New Nets
Oil Mounted.
Arkansas Hard
No. 7.....per doz. New Nets
Arkansas Soft. " "
Washita No. 717 " "
Oil—Unmounted.
Arkansas Hard per lb. New Nets
Arkansas Soft. " "
Lily White.... " "
Queer Creek... " "
Washita ..... " "
Scythe.
Black Diamond per gro. New Nets
Crescent ..... " "
Green Mountain " "
LaMelle ..... " "
Extra Quinine bog ..... " "
Red End ..... " "

STOPS, BENCH.

No. 10 Morrill pattern .....per doz. $11 00
No. 11 Stearns pattern ..... " 10 00
No. 15 Smith pattern ..... " 7 00

STOPPERS, FLUE

Common .....per doz. $1 10
Gem, No. 1..... " 1 10
Gem, flat, No. 3.... " 1 00

STRETCHERS.

Carpet.
Bullard's .....per doz. $3 90
Excelsior ..... " 5 25
Malleable Iron .. " 70
Perfection ..... " 6 30
King ..... " 4 50
Wire.
O. S. Elwood, No. 1 per doz. Nets
O. S. Elwood, No. 2 " "

SWIVELS

Malleable Iron .....per lb. $0 10
Wrought Steel .....per gro. 4 50

TACKS.

Bill Posters' 6-oz. 25-lb. boxes per lb 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb.....15½c

TAPES, MEASURING.

Asses' Skin .....List & 40%

THERMOMETERS.

Tin Case....per doz. 80c & $ 1 25
Wood Backs " 2 00 & 12 00
Glass ..... " 12 00

TIES.

Bale.
Single Loop, carload lots .....75 & 7%
Single Loop, less than car lots .....70 & 15%

TRAPS.

Mouse and Rat.	Per Gross
Sure Catch Mouse Traps.	$ 2 10
Vim Mouse Traps.....	2 10
Short Stop Mouse Traps.	1 80
Wood Choker Mouse Traps, 4 hole.....	10 25
	Per Doz.
Sure Catch Rat Traps....	$0 90
Dead Easy Rat Traps....	1 00
Packed in One Bushel Band Stave Baskets.	
	List per Bushel
Sure Catch Mouse Traps (360 Traps)	$ 5 25
Short Stop Mouse Traps (360 Traps)	4 50
Sure Catch Rat Traps (54 Traps)	3 60
Short Stop Rat Traps (54 Traps)	3 15
Assorted Mouse and Rat Traps.	List per Bushel.
Sure Catch (216 Mouse Traps and 26 Rat Traps)	$4 90
Short Stop (216 Mouse Traps and 26 Rat Traps)	4 25

TROWELS.

Cement.
Atkins No. 6.....$19 50
" No. 9..... 25 50

TWINE.

White Cotton.
Eureka, 4-ply .....per lb. 30c
Jute.
3-ply and 6-ply Bale Lots 22½c

VALLEY.

Milcor .....
Galv. formed or roll.....60%

VENTILATORS.

Standard .....30 to 40%

VISES.

No. 700 Hand, Inches	4½	5	5½	
Doz. $11 15	13 00	14 85		
No. 701. In.	4	5	6	
Doz. $11 15	13 00	16 70		

No. 1, Genuine Wentworth, Noiseless Saw....per doz. 9 25
No. 3, Genuine Wentworth, Noiseless Saw...per doz. 12 75
No. 500, All Steel Folding Saw .....per doz. 16 00

WASHERS.

Over ½ in. barrel lots per 100 lbs.....$6 25
Iron and Steel.

In.	5/16	⅜	½	⅝	¾
	10¼c	9¾c	7¾c	7½	7 2/5c

WEATHER STRIPS.

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No. 670, Domestic "	43	50
No. 110, Brighton "	39	00
No. 750, Guarantee "	51	00
No. 740, Bicycle "	42	50
No. 22, Pioneer "	25	50
No. 2, Superb "	25	50

ADVERTISERS' INDEX

The dash (—) indicates that the advertisement does not appear in this issue.

A

Aeolus Dickinson Co..... —
American Brass Co..... —
American Furnace Co..... 28
American Rolling Mill Co.... .....Front Cover
American School of Sheet Metal Pattern Drafting.... —
American Steel & Wire Co....159
American Stove Co..... —
American Wood Register Co.. 50
Arex Company 157
Ashton Mfg. Co..... —
Auer Register Co..... 48

B

Berger Bros. Co.....149
Bernz Co., Otto 155
Bertsch & Co.....157
Braden Mfg. Co.....159
Brillion Iron Works..... 39
Bullard & Gormley Co.....159
Burgess Soldering Furnace Co. —
Burton Co., W. J..... —

C

Callender Soldering Process Co.162
Carr Supply Co..... 54
Chicago Elbow Machine Co.. —
Chicago Solder Co.....153
Clark & Co., Geo. M..... —
Clark-Smith Hardware Co....157
Clayton & Lambert Mfg. Co..153
Cleveland Castings Pattern Co. 38
Coes Wrench Co. 159
Colburn Heater Co..... 38
Cooperative Foundry Co..... 18
Copper & Brass Research Association ..... —
Cornish & Co., J. B..... —
Cortright Metal Roofing Co...155

D

Dieckmann Co., Ferdinand....145
Diezer Mfg. Co., Geo. W.....153
Double Blast Mfg. Co.....153
Dreis & Krump Mfg. Co..153-155
Dunning Heating Supply Co.. 51

E

Eaglesfield Ventilator Co..... 50
Ewert & Kutschied Mfg. Co.. —
Excelsior Steel Furnace Co... 26

F

Fanner Mfg. Co..... 56
Farquhar Furnace Co..... —
Federal Varnish Co..... —
Forest City Fdy. & Mfg. Co. 36
Forming Machine Corp.....147
Fox Furnace Co..... 58
Fox, M. L..... 41
Friedley-Voshardt Co.....157

G

Gerock Bros. Mfg. Co.....157
Globe Stove & Range Co..... 32
Gohmann Bros. & Kahler..... —

H

Hall-Neal Furnace Co..... 36
Harrington & King P'f'g Co..157
Hart & Cooley Co..... 45
Haynes-Langenberg Mfg. Co.. 34
Heller Bros. ..... —
Henry Furnace & Fdy. Co.... 20
Hero Furnace Co..... 24
Hess-Snyder Co. 27
Hessler Co., H. E..... —
Homer Furnace Co..... 29
Hones, Inc., Chas. A..... —
Honeywell Heating Spec. Co.. 37
Hussey & Co., C. G.....162
Hunter Hardware Co..... 40
Hyfield Mfg. Co..... —

I

Independent Register & Mfg. Co. 49
Inland Steel Co. 155
International Heater Co..... 60
Iwan Bros. Co. 157

J

Johnson Co., Inc., Chas..... 57

K

Kant-Break Ladders, Inc..... —
Kirk-Latty Mfg. Co..... 38
Kruse Co. 2

L

Lalance & Grosjean Mfg. Co.. —
Lamneck & Co., W. E..... 55
Lennox Furnace Co..... 17
Lupton's Sons, David.. ..... —

M

Machine Appliance Corp..... —
Majestic Co. 43
Malleable Iron Range Co..... —
Manny Heating Supply Co.... 40
Maplewood Machinery Co.... —
Marshalltown Mfg. Co..... —
May-Fiebeger Co. 39
Merchant & Evans Co..... —
Meyer Furnace Co., The.....8-9
Meyer & Bros. Co., F.....52-53
Meyer Mfg. Co., Fred J.....162
Michigan Stove Co., The..... —
Miles Furnace Fan Co..... 33
Milwaukee Corr. Co..Back Cover
Monroe Fdy. & Furnace Co.... 14
Mt. Vernon Furn. & Mfg Co. 21
Mueller Furnace Co.....6-7

N

National Institute of Accounting, Inc. ..... —
New Jersey Zinc Co., The.... —
Northwestern Stove Repair Co. 38

O

Oakland Foundry Co..... 25
Oliver Oil-Gas Burner Co..... 35
Osborn Co., The J. M. & L. A.151

P

Peck, H. E.....162
Peck, Stow and Wilcox Co.... —
Premier Warm Air Heater Co. 23

Q

Quick Furnace & Supply Co.. 30
Quick Meal Stove Co.....155
Quincy Pattern Co..... 38

R

Rock Island Register Co..... 47
Ross-Gould ..... —
Rudy Furnace Co..... 19
Ryerson & Son, Jos. T..... —

S

Schieble-Moncrief Heater Co.. 38
Schill Bros. Co., The..... 22
Schwab & Sons Co., R. J....10-11
Simms Foundry Corp..... 16
Special Chemicals Co.....155
Standard Furn. & Supply Co. 41
Standard Ventilator Co.....157
Stearns Register Co..... 46
St. Clair Foundry Corp..... 51
St. Louis Tech. Inst.....151
Stove Dealers Supply Co..... —
Sullivan-Geiger Co. 38

T

Taylor Co., N. & G..... —
Thatcher Furnace Co..... 15
Tuttle & Bailey Mfg. Co.....163

U

Utica Heater Co.....4-5

V

Vedder Pattern Works..... 38
Viking Shear Co..... —

W

Walworth Run Fdy. Co..... 42
Waterloo Register Co..... 44
Waterman-Waterbury Co..... 3
Whitney Mfg. Co., W. A..... —
Whitney Metal Tool Co..... —
Wise Furnace Co.....12-13

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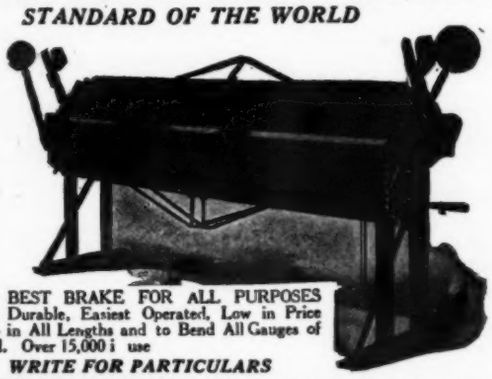

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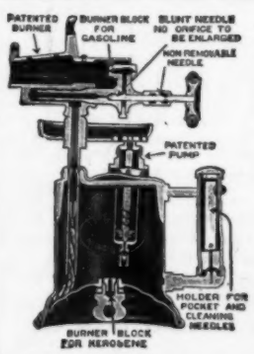
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American Steel & Wire Co., Chicago, Ill.

Bolts and Nuts
Ryerson & Son, Jos. T., Chicago, Ill.

Bolts—Stove.
Kirk-Latty Mfg. Co., Cleveland, Ohio

Brakes—Cornice.
Dreis & Krump Mfg. Co., Chicago, Ill.
Forming Machine Corp., Buffalo, N. Y.
Maplewood Machinery Co., Chicago, Ill.

Brass and Copper.
American Brass Co., Waterbury, Conn.
Hussey & Co., C. G., Pittsburgh, Pa.
Copper & Brass Research Ass'n, New York, N. Y.
Merchant & Evans Co., Philadelphia, Pa.

Builders' Hardware.
Bullard & Gormley, Chicago, Ill.

Cans—Garbage.
Osborn Co., The J. M. & L. A., Cleveland, O.

Castings—Malleable.
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal.
Burton Co., W. J., Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Chaplets.
Fanner Mfg. Co., Cleveland, Ohio

Chimney Tops.
Iwan Brothers, South Bend, Ind.

Coal Chutes.
Majestic Co., Huntington, Ind.

Cornices.
Burton Co., W. J., Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Cut-Offs—Rain Water.
Milwaukee Corrugating Co., Milwaukee, Wis.
Sullivan-Geiger Co., Indianapolis, Ind.

Eaves Trough.
Berger Bros. Co., Philadelphia, Pa.
Burton Co., The W. J., Detroit, Mich.
Clark-Smith Hardware Co., Peoria, Ill.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
New Jersey Zinc Co., The, New York, N. Y.

Elbows and Shoes—Conductor.
American Rolling Mill Co., Middletown, Ohio
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Enamel Ware.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Enamels—Wood.
Cornish & Co., J. B., Chicago, Ill.
Federal Varnish Co., Chicago, Ill.

Fence Gates.
American Steel & Wire Co., Chicago, Ill.

Fenders.
Meyers Mfg. Co., Fred J., Hamilton, Ohio

Files.
Heller Bros. Co., Newark, N. J.

Furnace Fans.
Honeywell Heating Specialties Co., Wabash, Ind.
Miles Furnace Fan Co., Cleveland, Ohio

Furnace Rings.
Independent Register & Mfg. Co., Cleveland, Ohio
Walworth Run Fdy. Co., Cleveland, Ohio

Furnaces—Warm Air.
American Furnace Co., St. Louis, Mo.
Brillion Iron Works, Brillion, Wis.
Carr Supply Co., Chicago, Ill.
Colburn Heater Co., Marshalltown, Iowa
Cooperative Foundry Co., Rochester, N. Y.
Dunning Heating Supply Co., Milwaukee, Wis.
Excelsior Steel Furnace Co., Chicago, Ill.
Farquhar Furnace Co., The, Wilmington, Ohio
Forest City Fdy. & Mfg. Co., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Fox, M. L., Columbiaville, Mich.
Globe Stove & Range Co., Kokomo, Ind.
Hall-Neal Furnace Co., Indianapolis, Ind.
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hero Furnace Co., Sycamore, Ill.
Hess-Snyder Co., Massillon, Ohio
Homer Furnace Co., Coldwater, Mich.
International Heater Co., Utica, N. Y.
Kruse Co., Indianapolis, Ind.
Lamneck Co., W. E., Columbus, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Majestic Co., Huntington, Ind.
Manny Heating Supply Co., Chicago, Ill.
Meyer Furnace Co., Peoria, Ill.
Michigan Stove Co., The, Detroit, Mich.
Monroe Fdy. & Furnace Co., Monroe, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., Milwaukee, Wis.
Oakland Foundry Co., Belleville, Ill.
Premier Warm Air Heater Co., Dowagiac, Mich.
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Scheible-Moncrief Heater Co., Cleveland, Ohio
Schill Bros. Co., The Crestline, Ohio
Schwab & Sons Co., R. J., Milwaukee, Wis.
Simms Foundry Corp., Racine, Wis.
Standard Furnace & Supply Co., Omaha, Nebr.
St. Clair Foundry Corporation, Belleville, Ill.
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Thatcher Furnace Co., Chicago, Ill.
Utica Heater Co., Utica, N. Y.
Waterman-Waterbury Co., Minneapolis, Minn.
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Garages—Metal.
Milwaukee Corrugating Co., Milwaukee, Wis.

Guards—Fire.
Meyers Mfg. Co., Fred J., Hamilton, Ohio

Gutter Formers.
Forming Machine Corp., Buffalo, N. Y.

Handles—Boiler.
Berger Bros. Co., Philadelphia, Pa.

Hangers—Eaves Trough.
Milwaukee Corrugating Co., Milwaukee, Wis.

Heaters—School Room.
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Hero Furnace Co., Sycamore, Ill.
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Monroe Fdy. & Furnace Co., Monroe, Mich.
Standard Furnace & Supply Co., Omaha, Neb.

Horse Shoes.
American Steel & Wire Co., Chicago, Ill.

Indoor Closets.
Independent Register & Mfg. Co., Cleveland, Ohio

Jobbers—Hardware.
Bullard & Gormley Co., Chicago, Ill.
Clark-Smith Hardware Co., Peoria, Ill.

Kitchen Utensils.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Ladders.
Kant-Break Ladder Co., Inc., St. Louis, Mo.

Lath—Expanded Metal.
Milwaukee Corrugating Co., Milwaukee, Wis.

Machines—Crimping.
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert.
Bertsch & Co., Cambridge City, Ind.

Machines—Razor Blades.
Hyfield Mfg. Co., New York, N. Y.

Machines—Stove Pipe.
Hemp & Co., St. Louis, Mo.

Machines—Tinsmiths'
Bertsch & Co., Cambridge City, In.d
Chicago Elbow Machine Co., Oak Park, Ill.
Dreis & Krump Mfg. Co., Chicago, Ill.
Ewert & Kutscheid Mfg. Co., Chicago, Ill.
Forming Machine Corp., Buffalo, N. Y.
Hemp & Co., St. Louis, Mo.
Maplewood Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A. Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Jos. T., Chicago, Ill.
Whitney Mfg. Co., W. A., Rockford, Ill.
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Mailing Lists.
Ross-Gould, St. Louis, Mo.

Metals—Perforated.
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Miters.
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Braden Mfg. Co., Terra Haute, Ind.
Milwaukee Corrugating Co., Milwaukee, Wis.

Nails—Slating.
Hussey & Co., C. G., Pittsburgh, Pa.

Nails—Wire.
American Steel & Wire Co., Chicago, Ill.

Oil Burners.
Oliver Oil-Gas Burner Co., St. Louis, Mo.

Ornaments—Sheet Metal.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.
Milwaukee Corrugating Co., Milwaukee, Wis.

Patterns—Furnace & Stove.
Cleveland Castings Pattern Co., Cleveland, Ohio
Quincy Pattern Co., Quincy, Ill.
Vedder Pattern Works, Troy, N. Y.

Pipe and Fittings—Furnace.
Carr Supply Co., Chicago, Ill.
Dunning Heating & Supply Co., Milwaukee, Wis.
Excelsior Steel Furnace Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Johnson Co., Inc., Chas., Peoria, Ill.
Lamneck Co., W. E., Columbus, Ohio
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Osborn Co., The J. M. & L. A., Cleveland, Ohio
Quick Furnace & Supply Co., Des Moines, Iowa
Standard Furnace & Supply Co., Omaha, Neb.

Pipe and Fittings—Stove.
Excelsior Steel Furnace Co., Chicago, Ill.
Hemp & Co., St. Louis, Mo.
Meyer & Bro. Co., F., Peoria, Ill.
Sullivan-Geiger Co., Indianapolis, Ind.

Pipe—Conductor.
Berger Bros. Co., Philadelphia, Pa.
Burton Co., W. J., Detroit, Mich.
Clark-Smith Hdw. Co., Peoria, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Hussey & Co., C. G., Pittsburgh, Pa.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
New Jersey Zinc Co., The, New York, N. Y.

Posts—Steel Fence.
American Steel & Wire Co., Chicago, Ill.

Punches.
Bertsch & Co., Cambridge City, Ind.
Machine Appliance Corporation, The, Brooklyn, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Punches—Combination Bench and Hand.
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Punches—Hand.
Machine Appliance Corporation, The, Brooklyn, N. Y.
Whitney Metal Tool Co., Rockford, Ill.

Ranges—Combination Gas & Coal.
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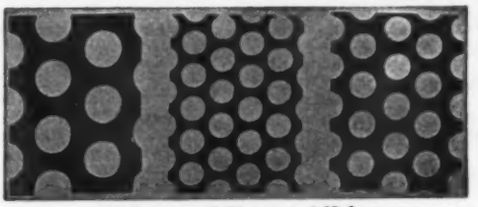

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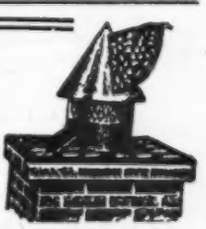

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American Wood Register Co., Plymouth, Wis.

Regulators—Heat.
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Hessler Co., H. E., Syracuse, N. Y.
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Callender Soldering Process Co., Chicago, Ill.

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Milwaukee Corrugating Co., Milwaukee, Wis.

Rivets—Stove.
Kirk-Latty Mfg. Co., Cleveland, Ohio

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Rods—Stove.
Kirk-Latty Mfg. Co., Cleveland, Ohio

Rolls—Forming.
Bertsch & Co., Cambridge City, Ind.

Roof—Flashing.
Hessler Co., H. E., Syracuse, N. Y.
Milwaukee Corrugating Co., Milwaukee, Wis.

Roofing—Iron and Steel.
American Rolling Mill Co., Middletown, Ohio
Burton Co., W. J., Detroit, Mich.
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Inland Steel Co., Chicago, Ill.
Merchant & Evans Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Roofing—Tin.
Taylor Co., N. & G., Philadelphia, Pa.

Roofing Zinc.
New Jersey Zinc Co., The, New York, N. Y.

Rubbish Burners.
Hart & Cooley Co., New Britain, Conn.

Sal-Ammoniac.
Special Chemicals Co., Highland Park, Ill.

Schools—Accounting
National Institute of Accountancy, Inc. Chicago, Ill.

Schools—Sheet Metal Pattern Drafting.
American School of Sheet Metal Pattern Drafting, New Haven, Conn.
St. Louis Technical Institute, St. Louis, Mo.

Screens—Perforated Metal.
Harrington & King Perforating Co., Chicago, Ill.

Shears—Hand and Power.
Ewert & Kutscheid Mfg. Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Peck, Stow & Wilcox Co., Southington, Conn.
Viking Shear Co., Erie, Pa.

Sheets—Black and Galvanized.
American Rolling Mill Co., Middletown, Ohio
Inland Steel Co., Chicago, Ill.
Merchant & Evans Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Iron.
American Rolling Mill Co., Middletown, Ohio
Merchant & Evans Co., Philadelphia, Pa.
Ryerson & Son, Jos. T. Chicago, Ill.

Sheets—Tin.
Merchant & Evans Co., Philadelphia, Pa.
Taylor Co., N. & G., Philadelphia, Pa.

Shingles—Zinc.
Milwaukee Corrugating Co., Milwaukee, Wis.

Sifters—Ash.
Diener Mfg. Co., G. W., Chicago, Ill.

Sifters—Flour.
Meyers Mfg. Co., Fred J., Hamilton, Ohio

Sky Lights.
Burton Co., W. J., Detroit, Mich.
Milwaukee Corrugating Co., Milwaukee, Wis.

Solder.
Chicago Solder Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Taylor Co., N. & G., Philadelphia, Pa.

Soldering Furnaces.
Ashton Mfg. Co., Newark, N. J.
Bernz Co., Otto, Newark, N. J
Burgess Soldering Furnace Co., Columbus, Ohio
Clayton & Lambert Mfg. Co., Detroit, Mich.
Diener Mfg. Co., G. W., Chicago, Ill.
Double Blast Mfg. Co., North Chicago, Ill.
Hones, Inc., Chas. A., Baldwin, Long Island, N. Y.
Quick Meal Stove Co., St. Louis, Mo.

Soldering Supplies.
Special Chemicals Co., Highland Park, Ill.

Specialties—Hardware.
Bullard & Gormley, Chicago, Ill.
Diener Mfg. Co., G. W., Chicago, Ill.
Heller Bros. Co., Newark, N. J.
Hessler Co., H. E., Syracuse, N. Y.
Hyfield Mfg. Co., New York, N. Y.

Sporting Goods.
Bullard & Gormley, Chicago, Ill.

Stains—Oil and Acid.
Federal Varnish Co., Chicago, Ill.

Stars—Hard Iron Cleaning.
Fanner Mfg. Co., Cleveland, Ohio

Statuary.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.

Stoves—Camp.
Quick Meal Stove Co., St. Louis, Mo.

Stoves—Gas.
Clark & Co., Geo. M., Chicago, Ill.
Dangler Stove Co., Cleveland, Ohio
National Stove Co., Lorain, Ohio
New Process Stove Co., Cleveland, Ohio
Quick Meal Stove Co., St. Louis, M
Reliable Stove Co., Cleveland, Ohio
Stove Dealers Supply Co., Milwaukee, Wis.

Stoves—Gasoline and Oil.
American Stove Co., St. Louis, Mo.
Clark & Co., Geo. M., Chicago, Ill.
Dangler Stove Co., Cleveland, O.
New Process Stove Co., Cleveland, Ohio
Quick Meal Stove Co., St. Louis, Mo.

Stoves and Ranges.
American Stove Co., St. Louis, Mo.
Cooperative Foundry Co., Rochester, N. Y.
Globe Stove & Range Co., Kokomo, Ind.
Gohman Bros. & Kahler, New Albany, Ind.
Malleable Iron Range Co., Beaver Dam, Wis.
Michigan Stove Co., The, Detroit, Mich.
National Stove Co., Lorain, Ohio
Oakland Foundry Co., Belleville, Ill.
Quick Meal Stove Co., St. Louis, Mo.
Roesch Enamel Range Co., Belleville, Ill.
Schill Bros. Co., The Crestline, Ohio

Stove Pipe Reducer.
Sullivan-Geiger Co., Indianapolis, Ind.

Tacks, Staples, Spikes.
American Steel & Wire Co., Chicago, Ill.

Temperature Regulators.
Honeywell Heating Specialties Co., Wabash, Ind.

Tiles and Shingles—Metal.
Burton Co., W. J., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Tinplate.
Milwaukee Corrugating Co., Milwaukee, Wis.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Jos. T., Chicago, Illinois
Taylor Co., N. & G., Philadelphia, Pa.

Tin—Perforated.
Harrington & King Perforating Co., Chicago, Ill.

Tools—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Chicago Elbow Machine Co., Oak Park, Ill
Dreis & Krump Mfg. Co., Chicago, Ill.
Ewert & Kutscheid Mfg. Co., Chicago, Ill
Forming Machine Corp., Buffalo, N. Y.
Machine Appliance Corporation, The, Brooklyn, New York
Maplewood Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn
Ryerson & Son, Jos. T. Chicago, Ill.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill
Whitney Metal Tool Co., Rockford, Ill

Torches.
Ashton Mfg. Co., Newark, N. J.
Bernz Co., Otto, Newark, N. J
Burgess Soldering Furnace Co., Columbus, Ohio
Clayton & Lambert Mfg. Co., Detroit, Mich.
Diener Mfg. Co., G. W., Chicago, Ill.
Double Blast Mfg. Co., North Chicago, Ill.
Hones, Inc., Chas. A., Baldwin, Long Island, N. Y.
Quick Meal Stove Co., St. Louis, Mo

Trimmings—Stove.
Fanner Mfg. Co., Cleveland, Ohio

Varnishes.
Cornish & Co., J. B., Chicago, Ill.
Federal Varnish Co., Chicago, Ill.

Ventilators.
Aeolus Dickinson Co., Chiago, Ill.
Arex Company, Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Standard Ventilator Co., Lewisburg, Pa.

Ventilators—Ceiling.
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., New York

Water Heaters—Oil Burning.
Dangler Stove Co., Cleveland, O.

Wire.
American Steel & Wire Co., Chicago, Ill.

Wrenches.
Coes Wrench Co., Worcester, Mass.

Zinc.
Merchant & Evans Co., Philadelphia, Pa.
New Jersey Zinc Co., The, New York, N. Y.

GARDEN TOOLS, GENERAL AND BUILDERS' HARDWARE, MECHANICS' TOOLS, CUTLERY, GUNS, AMMUNITION, SPORTING GOODS AND FISHING TACKLE.

WHEN John Jones comes into your store to buy something you're out of —don't tell him you haven't got it— tell him you can get it for him promptly.

We make a specialty of supplying quality goods at right prices at the time you want them.

Get our prices now on your next order.

BULLARD & GORMLEY CO.
Wholesale Hardware
54-62 East Lake Street
CHICAGO. ILLINOIS

WIRE electrical, rope, barbed, plain, nails, tacks, spikes, bale-ties, hoops, springs, netting, wire fences, steel posts, steel gates, trolley wire, rail bonds, flat wire (strip steel), piano wire, horse shoes, round and odd-shape wire, screw stock concrete reinforcement. Aerial Tramways.

Illustrated Books describing uses, Free

American Steel & Wire Company
Chicago—New York

COES

FOR the customer who wants a Screw Wrench to do all sorts of work—to stand up under all kinds of strains—the Coes Steel Handle is the kind to sell.

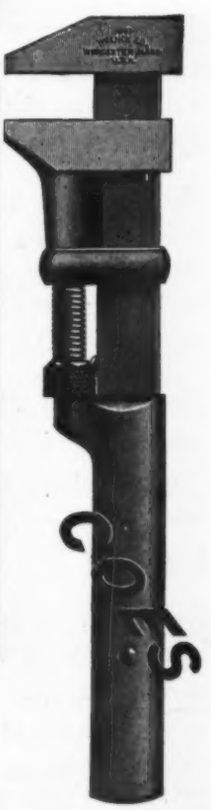
An all-steel wrench, properly heat treated, wearing parts hardened.

The ideal wrench for "all-'round rough use."

How is Your Steel-Handle Stock?

Coes Wrench Co.
ESTABLISHED 1841 IN
Worcester, Mass.

J. C. McCARTY & CO., 29 Murray Street, New York
JOHN H. GRAHAM & CO., 113 Chambers St., New York
FENWICK FRERES, 8 Rue de Rocroy, Paris, France



STEEL HANDLE

You still have two long weeks left—

BUT

Remember that January 12th is the last day on which entries may be made

Photographs and descriptions of window displays for entry in this competition are coming in fast.

We want yours and if you haven't mailed them in or have not as yet, had at least one good display photographed—DO IT NOW.

Read over the brief, simple rules governing this contest—no red tape and you can send in as many entries as you desire.

Remember, a good, attractive window, a display that sold goods for you has as good a chance to win a cash prize for you as any display entered by the best experts.

Here are the simple rules that govern the

AMERICAN ARTISAN AND HARDWARE RECORD

Window Display Competition

$100.00

in cash prizes

ALL photographs must be in the office of AMERICAN ARTISAN AND HARDWARE RECORD, 620 South Michigan Avenue, Chicago, Illinois, not later than ***January 12, 1924,*** in order to receive attention.

The window display must be photographed, and the display may be made up of goods from any of the following lines:

General Hardware, Machinists' Supplies, Builders' Hardware, Automobile Supplies, Sporting Goods, Fishing Tackle, House Furnishings and Paints, Cutlery, Dairy Supplies, Stoves, Ranges, Warm Air Furnaces, Sheet Metal or kindred lines.

THE photograph, *together with description of how the window display was arranged and the materials used,* may be sent by mail or express, charges prepaid.

Each photograph and description must be signed by a fictitious name or device and the same name or device must be placed within a sealed envelope containing the real name and address of the contestant, this sealed envelope to be enclosed with the photograph.

There is no limit to the number of entries you may make—the more you send in the better chance you have of winning a cash prize.

When the contest closes, three judges will be selected who are prominent in the trade to choose the winners. The fact that no names appear anywhere on the photograph insures absolute impartiality from the judges in making their decision.

Four prizes, totaling $100.00, are to be awarded for the entries adjudged the most meritorious.

These are:

First prize, $50.00 Second prize, $25.00
Third prize, $15.00 Fourth prize, $10.00

AMERICAN ARTISAN AND HARDWARE RECORD reserves the right to publish all photographs and descriptions submitted in the contest.

Address all photographs and descriptions to

AMERICAN ARTISAN AND HARDWARE RECORD
WINDOW DISPLAY COMPETITION
620 SOUTH MICHIGAN AVENUE CHICAGO, ILLINOIS

WANTS AND SALES

For paid yearly subscribers, AMERICAN ARTISAN AND HARDWARE RECORD will insert under this head advertisements of not more than fifty words *WITHOUT CHARGE*. Employers wishing to secure employes, parties desiring to purchase or sell business, secure partners, or to exchange, etc., will find that these pages offer excellent opportunities to satisfy their wants. Clerks and tinsmiths looking for situations will find it to their advantage to use these columns. Those who respond to these announcements please mention that they "READ THE ADVERTISEMENT IN AMERICAN ARTISAN AND HARDWARE RECORD."

BUSINESS CHANCES

For Sale Stock of hardware—invoice with fixtures about $5,000. We will sell or rent building, stock to be paid for in cash. Address C-37, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

For Sale—Good established Plumbing, Heating and Furnace business at Petersburg, Illinois. Rent reasonable. Small stock at invoice price. Reason for selling is that owner died. Address (Miss) Elizabeth Smith, Petersburg, Illinois. 26-3t

Lightning Rods—Dealers who are selling lightning protection will make money by writing to us for our latest factory to dealer prices. We employ no salesmen and save you all overhead charges. Our pure copper cable is endorsed by the mutual insurance companies and the National Board of Fire Underwriters. Write today for samples and prices. L. K. Diddie Company, Marshfield, Wisconsin.

For Sale—Hardware and tin shop business. Have been in business several years at same location and have been very successful. Address C-32, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-3t

For Sale—A fine stock of Hardware and Paint in one of Iowa's best cities. Warren fixtures; good business. Will invoice about $20,000 or would consider a partner. Address C-23, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 23-3t

For Sale—Sheet metal and furnace business, including tools, stock, house, lot, shop and garage. Good income. Property in fine location. Will sell all or property only. Reason going to California. Address F. G. Oberlin, 214 South Larch Street, Lansing, Michigan. 23-3t

Wanted—A large Pacific Coast Jobber desires a line of low priced cottage type heaters for wood only and coal and wood. Both all cast iron and cast top and base, and must be modern and low in price. Can use some other lines of value. Address C-24, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 23-3t

For Sale—Sheet metal roofing and furnace business in Central Nebraska in a town of 12,000. No competition. Large territory to draw from. Annual business between $40,000 and $50,000. Will sell one-half interest or all. Invoice about $3,500. Address C-35, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-3t

For Sale—A clean little manufacturing and jobbing business. Doing a national mail order business, covering the U. S. and Canada in its particular line. Located in North Missouri, in a good town of 5,000 population. Capital of $12,000 will handle it. For particulars, write to C-25, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 23-ufn

BUSINESS CHANCES

For Sale—A one ton Mesker Bros. elevator for 2 story building; platform 4x6'. Good condition. Address Redlich and Son, Jerseyville, Illinois. 25-3t

For Sale—Five sizes of wood and metal patterns for oval heaters. New Design, special features. Two sizes Steel Range and Kitchen Heater iron patterns. Urns, rods, mica, hinge pins, knobs, shakers and lifters for 500 heaters. 540 Shakers and Lifters for Ranges. Three H.P. Motor, Bandsaw, shafting, belting, pulleys bench. Emery stand. Address C-34, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

HELP WANTED

Wanted—At once, a man who can do general work in a country shop in a town of 1,800. Have a good place to work. Address C-31, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-3t

Wanted — Experienced plumber and sheet metal worker for steady work in Winter Haven, Florida. State wages, experience, etc., in first letter. Winter Haven Plumbing Company, 607 East Oak Street, Winter Haven, Florida. 25-3t

Wanted—An all around man for a Wisconsin town of 500. A man that can do plumbing and furnace work. Married man preferred. State wages. Address C-29, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-3t

Anyone knowing the whereabouts of Mr. J. J. Frietsch, of Morrison, Illinois, will confer a great favor by giving information which will enable me to locate him. Mr. Frietsch disappeared last summer. Address Mrs. J. J. Frietsch, % Mrs. F. Westelin, 4251 N. Albany Ave., Chicago, Illinois. 21-ufn

SITUATION WANTED

Situation Wanted—Tinner and furnace man desires position. Am an all around tinner and can do outside and inside work. W. J. Mack, 66 South River Street, Janesville, Wisconsin. 26-3t

Situation Wanted—By a first-class all around sheet metal worker. Would prefer a general all around shop. Am a good furnace man and can take charge and run shop. Address Box 121, Elyria, Ohio. 25-3t

Situation Wanted—By good all around tinner, plumber and heating man. Can do any kind of work that comes to a shop. Am married and would like steady job the year round. Please state wages in first letter. Address C-36, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

Situation Wanted — As sheet metal worker by a young married man with six years' experience in furnace installation of all kinds. Gutter work and general tinshop repair work, and can also qualify as clerk in hardware store. Northern Iowa or Southern Minnesota preferred. Address C-27, care of AMERICAN ARTISAN, 620 South Michigan Ave., Chicago. 23-3t

Situation Wanted — As sheet metal worker. Fast worker and no clock watcher. Good pattern cutter and estimator in all the different lines. Plan, layout and install warm air furnaces according to the standard Code. Will go anywhere, but prefer Iowa. Address K. L., care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 26-3t

TINNERS' TOOLS

Wanted—A good used eight-foot brake to handle 20 to 27 gauge sheets. Send price and description to The L. A. Althoff Manufacturing Company, LaPorte, Indiana. 26-1t

TINNERS' TOOLS

For Sale—Complete set of tinner's tools, including bench machines, square shears, folders, rolls, rotary slitting shears, and cornice brake. Mehl Brothers, Coffeyville, Kansas. 22-3t

Wanted—Small burring machine with Standard. Give price. W. F. O'Neill, 110 East 26th St., Minneapolis, Minnesota. 24-3t

Tinners' Tools Wanted—Squaring Shear, Folder, Rolls, Crimper and Beader and small Forming Brake. Please give us condition of tools and price in first letter. Yates Stove & Furnace Repair Works, West Water and Broadway Sts., Piqua, Ohio. 24-3t

For Sale or Trade—For metal or plumbing tools: 1 Warren Oil Separator for 3" openings; 1 John Manvill Ball Steam Traps, 1" size, and 1 John Manvill Ball Steam Traps, 2" size. Address C-30, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-3t

For Sale—One large and one small beading machine; 1 setting down machine; 1 crimper-crimper rolls flush with front; 1 hollow mandrel; 1 beakhorn stake; 1 blowhorn stake, and all kinds of hand tools. Address C-33, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-3t

BOOKS

Order your books now with your renewal to AMERICAN ARTISAN. You can save 10 per cent on your total purchase. Subscription to AMERICAN ARTISAN is $5.00 for 3 years. Take advantage of this saving also.

FREE—FREE—We will send FREE to every Sheet Metal Contractor in the country who will write us, a copy of our new 10-page book catalog which lists the best Trade Books and Patterns to be had. The first page of this catalog tells how to save money on your book purchases. Write for your copy today. AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.

The book, "Home Instruction for Sheet Metal Workers," by William Neubecker, and edited by Frank X. Morlo, contains facts that you want to know and know how to use. A practical instruction manual for the apprentice, mechanic and master sheet metal worker, covering the course of instruction given students in the sheet metal department at the New York Trade School. Cutting, forming, preparing full-size details from architects' blueprints, developing patterns, and bending on the brake and setting the work together. Chapters on skylight and pitched skylights, stationary and movable louvres, turret sash, gearing, etc. 400 pages, 684 illustrations, bound in cloth, with 15 folding plates bound separately. Price, $5.00. Order from the Book department, AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.

UNIVERSAL SHEET METAL PATTERN CUTTER, Vol. II.

The second volume of this practical work is now ready for delivery, and deals with the more advanced branches of sheet metal work, in fact is largely devoted to the architectural end of the business. It is illustrated with 711 engravings showing all methods under treatment, as well as prospective views of the subjects of the patterns, and other demonstrations in their finished state. It includes drawing, full sized detailing and lettering, development and construction of sheet metal cornices and skylights, leaders, roof gutters, mouldings, pediments, circular work, dormer and bay windows, sheet metal ornamentations, electrically illuminating signs, hollow metal windows, frames and fire doors, metal roofing, etc. Instructions accompanying all drawings are full and easily workable. It is well bound in heavy cloth to correspond with the first volume. Price $7.50 or with American Artisan and Hardware Record, one year, 52 issues, $8.55. Order direct from AMERICAN ARTISAN AND HARDWARE RECORD, 620 South Michigan Avenue, Chicago.

Special Notices — displayed want ads — are charged at the rate of $3.00 per inch per insertion.

PATENTS

HUBERT E. PECK
Patent Attorney
Barrister Building, WASHINGTON, D.C

WANTED

High grade furnace salesman for established line of furnaces. Wisconsin and Illinois territory. M-45, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 23-ufn

WANTED

An experienced warm air furnace man to take charge of a branch in one of the South's most progressive towns. Must be a good salesman, with a thorough knowledge of practical installation, and ability to estimate on all classes of warm air heating. Gilt edged references required. Address M-40, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Ill 20-ufn

SALESMAN WANTED

for Northern Illinois and Southern Wisconsin, to sell stoves and furnaces. Must be experienced and successful. Good proposition for right man. ROCK ISLAND STOVE COMPANY, Rock Island, Illinois. 26-3t

SALESMAN

Chicago Branch large national jobber sheet steel, tinplate, brass and copper, to call on Chicago trade. Must be young, high grade man with experience in at least one of these lines. State briefly age and experience. Exceptional opportunity. Address M-51, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 26-1t

MR. J. J. FRIETSCH
of Morrison, Ill.

ANYONE knowing the whereabouts of the above named party will confer a great favor by giving information which will enable me to locate him Mr. Frietsch disapppeared last summer.

Address — Mrs. J. J. Frietsch, c/o Mrs. F. Westelin, 4251 N. Albany Ave., Chicago, Ill. 21-ufn

BOOK OF VALUABLE ENAMELING FORMULAS

By the late Otto Grampp, the universally known enameling expert. This exceptional collection consists of thirty-two formulas for enameling Sheet Steel and Cast Iron. These formulas are thoroughly reliable, cover a wide range of enameling shades and colors, and each formula is accompanied with complete information. Price, $20. Sent C. O. D. For sale by his widow, Mrs. Otto Grampp, R. F. D. No. 1, Jewell, New York. 16-ufn

SPECIAL NOTICES

FURNACE SALESMAN

Traveling sales position wanted for 1924 with furnace manufacturer making reputable line. Was for number of years with one company, covering Central and Western States. Address M-48, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-2t

FOR SALE

A clean little manufacturing and jobbing business. Doing a national mail order business covering the U. S. and Canada in its particular line.

Located in North Missouri, in a good town of 5000 population.

Capital of $12,000 will handle it.

For particulars, write to M-43, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Ill. 21-ufn

Manufacturers of Warm Air Heaters

HERE'S the salesman you're looking for.

He can help you in that sales drive that you are putting on — he gets results—he knows the game —he knows the trade and he is well known and respected by thousands of live, high class warm air heater installers throughout the country and especially in the middle west and west.

He has called on the trade and sold warm air heaters for many years—yet he's an up-to-date salesman who works every week of the year—rain or shine.

This salesman's name is AMERICAN ARTISAN and you can secure his services at once.

Write today and get complete details concerning his ability to work for you and with your regular salesmen.

SPECIAL NOTICES

SALESMEN WANTED

ON or before January First, for Indiana and other Mid-Western territories. Traveling experience essential; heating experience desirable. Write fully and in confidence.

L. J. Mueller Furnace Company

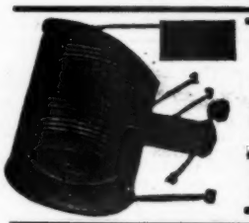
193 Reed Street, Milwaukee, Wisconsin 23-ufm

TOPNOTCH FURNACE SALESMEN

FOR ILLINOIS AND INDIANA

We have splendid openings for live men with good records who can produce.

International Heater Co.
1923 Wentworth Avenue
Chicago, Illinois ufn



HUNTER'S SIFTER
"The Genuine"
A good seller at all times.
Write today for complete catalog
FRED J. MEYERS MFG. CO.
HAMILTON, OHIO

ICE CREAM

CANS, MILK CANS, PACKING HOUSE EQUIPMENT, ETC.
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RETINNING

every so often—You can do this work for the firms in your territory and make good profits.

We manufacture a small, inexpensive Retinning Apparatus.

We supply acids and chemicals and explain thoroughly how to use our equipment.

Get our Retinning Outfit in your shop now—write for literature and sample of tinning.

CALLENDER SOLDERING PROCESS CO.
14 So. Jefferson Street Chicago, Illinois

C. G. Hussey & Co.

Rolling Mills and Office
PITTSBURGH, PA.

Manufacturers of

SHEET COPPER, BOTTOMS, ROLL COPPER, TINNED AND POLISHED COPPER, NAILS, SPIKES, RIVETS, CONDUCTOR PIPE, EAVES TROUGH, ELBOWS, SHOES, MITRES, ETC.

Branch Warehouses in New York, Chicago and St. Louis

Of Importance To You

BY the Jumping John Rogers, you are dead right.

There has been so much "hollering" down the rain barrel, about the standardization of registers, that the barrel is all full of "hollers," and there isn't any rain.

What good is a rain barrel with no rain in it?

It may be all right for a lot of us register makers to get together and do a power of "hollering" about the registers we are going to make from now on, and henceforth and forever.

But to my notion, you fellows who sell registers, are the fellows to do the real deciding.

We had better slide down your cellar door, instead of trying to make you slide down ours.

The sizes of registers "most of" you want, are the very ones we are now making the "most of." So far as you and our folks are concerned they mean standardization.

You have shown us how we could cut out several sizes.

But don't think for a minute we are going to ring down the curtain at once on the sizes that are not standard.

You ought to see the No. 900 base board register in Tanbo Antique. Looks like Mr. Tiffany himself had done the job.

100 % Capacity

After exhaustive tests over a long period, conducted by experts under the supervision of the University of Illinois, they reported to the National Warm Air Heating & Ventilating Association as follows:

"The results of these tests indicated that warm air Register Grilles do not offer an appreciable resistance to the flow of heated air, provided the free areas are not reduced below seventy per cent of the gross areas."

That means sizes suggested in our Register Standardization Circular are all 100% capacity.

Send for circular.

In all fairness, you should have plenty of time to continue to buy any such old sizes, until you have matched up your stock of installation parts.

Every one of the Register sizes that you men on the selling line have been calling for, are old friends of ours.

They were designed by us, following the idea of the experts, to secure 100% capacity.

Furthermore, we agree with you fully, that baseboard registers should not project into the room any more than necessary.

We will stand by you, solid as a rock, on that.

Now that you have induced us to standardize our sizes, don't you think it is kind of up to you to stop playing at being a Mexican jumping bean and stop jumping from Japan finishes to electro-plated, and back again. Land on Tanbo, and stay put.

The idea of standardization is to make as few things as possible do the work of as many as possible.

Right there, is where Tambo comes in.

That's about all for the present.

Only that we suggest the use of Tanbo Antique as the best all around one of the Tanbo Finishes.

Thanks for your help in unsnarling that standardization tangle.

Jee Bee

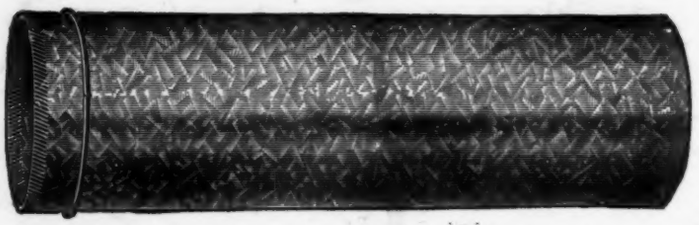
TUTTLE & BAILEY MFG CO.

Makers of Ferrocraft Metal Grilles
For Over 75 Years

36 Portland St.
BOSTON

2 West 45th St.
NEW YORK

1123-29 W



Milcor Tight-Coat Galvanized Pipe. Furnished in 26 and 24 gauge; lengths from 6 inches to 3 feet.

Write for copy of our new Reference Catalog on Milcor Trimmings.

"MILCOR"

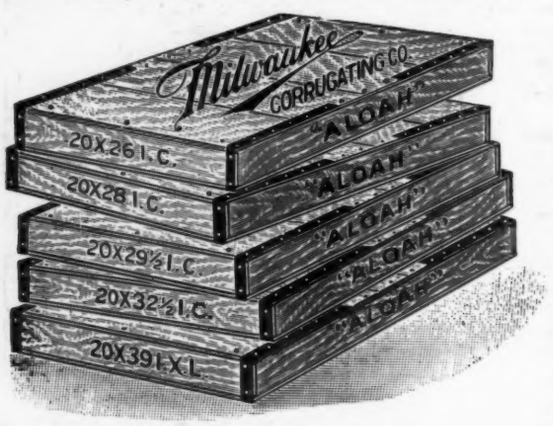
Furnace Pipe and Elbows

—preferred products!

THE preciseness of our workmanship, combined with the highest grade materials obtainable, have made Milcor Furnace Pipes and Elbows the preferred products in this line. You can recommend them conscientiously to your trade, with positive assurance that satisfactory service will be rendered. You are certain of uniform quality.

Milcor adjustable Elbows will *not pull apart*. Our special machinery and equipment produces deep, well rounded grooves at the joints so that each joint fits snugly, yet is easily adjusted to any desired angle.

You can secure Milcor Furnace Pipes, Angles and Elbows made from Tight Coat Open-Hearth Galvanized Steel or from high grade Coke Tin. Ask your jobber—or write to us direct.

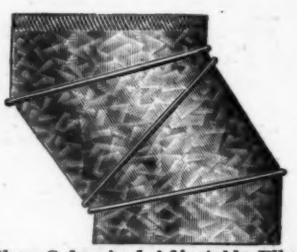


Prices on application.

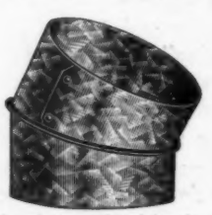
Galvanized and Black Sheets for Furnace Work

Furnace men and Sheet Metal Contractors recommend the Milcor Line of Galvanized Sheets and Coke Tin as the best obtainable. This superior quality is backed by speedy service *always*. We maintain a stock of *many tons* of black and galvanized sheets in all gauges so as to handle orders of any size without slightest delay.

90° Milcor Furnace Angle.



Milcor Galvanized Adjustable Elbow.



22½° Milcor Furnace Angle.

45° Milcor Furnace Angle.

Milwaukee Corrugating Company

Milwaukee —— Kansas City —— Minneapolis

MILCOR

Building Products